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ABSTRACT

This annotated bibliography is the sixth annual compilation of the abstracts of 228 documents added to the ERIC database during the year 1991 in the area of computer applications in elementary and secondary schools. The types of materials included are administrator guides, bibliographies, conference papers, evaluative reports, literature reviews, program descriptions, research reports, and teaching guides. The material is presented in four major sections: (1) Computer Assisted Instruction: Overview Documents--24 documents of general discussions on the topic; (2) Special Applications--78 documents divided into 14 categories: Artificial Intelligence/Expert Systems, Cognitive Processing/Thinking Skills, Computer Literacy, Computer Networks, Computer Equity, Counseling and Guidance, Courseware and Software, Ethics, Interactive Video, Keyboarding, Logo, Management/Administration, Conference Proceedings, Research, Simulation, and Testing; (3) Subject Areas--85 documents concerned with computer applications in the areas of business, English as a Second Language and foreign languages, language arts, mathematics, music, reading, science, social studies, vocational education and writing; (4) Special Populations--37 documents on computer applications for adult education, disabled learners, disadvantaged learners, gifted students, and early childhood education. Individual documents are presented alphabetically by author, or title when no personal author is available, within each section. Each entry includes the title and author of the document, information on price, and availability, the publication type, major ERIC descriptors, and an abstract. An alphabetical title of authors and information on ordering ERIC documents are included. (ALF)

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COMPUTER APPLICATIONS IN EDUCATION

The Best of ERIC, 1991

by Pamela McLaughlin

ERIC Clearinghouse on Information Resources
Syracuse University

IR-95

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COMPUTER APPLICATIONS IN EDUCATION

The Best of ERIC 1991

(formerly COMPUTER-BASED EDUCATION)

by Pamela McLaughlin

August 1992

ERIC® Clearinghouse on Information Resources
Syracuse University
Syracuse, New York

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Prior publications in this series from ERIC/IR are:

Computer Applications in Education: The Best of ERIC 1990, by Pamela McLaughlin. 1992.

Computer Based Education: The Best of ERIC 1989, by Pamela McLaughlin (ED 341 386). 1990.

Computer Based Education: The Best of ERIC 1988, by Pamela McLaughlin (ED 318 471). 1989.

Computer-Based Education: The Best of ERIC 1987, by Pamela McLaughlin (ED 318 474). 1988.

Computer-Based Education: The Best of ERIC 1986, by Pamela McLaughlin (ED 295 675). 1987

Computer-Based Education: The Best of ERIC 1983-85, by Pamela McLaughlin (ED 284 542). 1986.

Computer-Based Education: The Best of ERIC June 1976-1982. Revised and Updated, by Keith A. Hall (ED 232 615). 1982.

Computer-Based Education: The Best of ERIC June 1976-August 1980, by Keith A. Hall (ED 195 288). 1980. (Incorporated in the 1982 edition.)

Computer Assisted Instruction: The Best of ERIC 1973-May 1976, by Marian Beard (ED 125 608). 1976.

The Best of ERIC: Recent Trends in Computer-Assisted Instruction, by Richard E. Clark (ED 076 025). 1973.

This is the sixth annual update in this series.

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FOREWORD

At the ERIC Clearinghouse on Information Resources we continue to hear from our users that this summary volume is especially useful because it lists the document literature that does not get into journals or published books. In this annual compilation we have a variety of reports, guides, descriptions, and reviews that speak specifically to teaching and learning applications. The Editor organizes the content so that special interests are adequately served.

The *Best* of ERIC implies that each item is carefully screened from a much larger pool of potential entries. The Editor has, above all, used the criterion of utility in making the selections. Items are also selected to represent the variety of topics that are included from year to year. There are other publications that review the research literature and cover some of the more technical aspects of programming and hardware configurations.

We want this resource volume to be useful to practitioners who seek information that has been selected from the vast volume that is currently available. It must be timely; it must be succinct; it must be immediately usable. We believe we have met these standards. It we have faltered in any way, let us know. If you feel this annual review can be more helpful, we are open to your suggestions. And, if you have contributions to make to the ERIC database, please send them to our Clearinghouse.

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Introduction

This publication marks the sixth annual update of this series, the second volume with the expanded title **Computer Applications in Education: The Best of ERIC**. Other volumes in this series are listed on the back of the title page.

This series has been designed for use by educators who need to make decisions regarding computer applications in schools, or who want to stay abreast of new developments in this rapidly-changing field. This update provides a classified overview of the literature entered into the ERIC database in 1991 on the use of microcomputer and related technologies in elementary and secondary education, adult education, and special education. It should be noted that 1991 is the year when these materials were entered into the database, not the publication date.

Higher Education Excluded. Computer applications in higher education differ in many ways from applications in elementary and secondary schools. Differences include the availability of hardware and software, delivery mechanisms, the intensity of computer use in certain disciplines at this level, and other issues related to the growth and development of computing and management of computing resources in higher education. This area is sufficiently distinct to warrant separate treatment.

Scope of the Bibliography

Substantive ERIC documents from the 1991 volumes of **Resources in Education** (RIE) have been selected for inclusion in this publication; generally, journal articles have not been included due to their availability in other bibliographic sources. Types of materials targeted for selection include:

- Administrator guides
- Bibliographies
- Conference papers
- Evaluative reports
- Literature reviews
- Program descriptions
- Research reports
- Teaching guides

Search Strategy

As with previous editions, a general search of the ERIC database was conducted, limited to accession numbers for 1991 and eliminating higher education. Terms were searched as major descriptors and included: ARTIFICIAL INTELLIGENCE, AUTHORING AIDS, CAREER INFORMATION SYSTEMS, any term containing the root computer (which encompassed a large number of descriptors), COURSEWARE, DATA PROCESSING, any term containing the root DATABASE, DESKTOP PUBLISHING, ELECTRONIC MAIL, ELECTRONIC PUBLISHING, EXPERT SYSTEMS, GATEWAY SYSTEMS, HYPERMEDIA, INFORMATION SYSTEMS, INPUT-OUTPUT DEVICES, INTERACTIVE VIDEO, KEYBOARDING, any term containing the root MICROCOMPUTER, ONLINE SYSTEMS, OPTICAL DISKS, SPREADSHEETS, SYSTEMS DEVELOPMENT, TELECOMMUNICATIONS, VIDEODISKS, and WORD PROCESSING. This search resulted in 457 items, 50 fewer items than the previous edition. Of these, 228 were selected for inclusion in the bibliography.

Items selected for this collection are primarily concerned with computer applications in education in the United States, although some reports from other English-speaking nations are included. Very short papers or opinion papers were excluded, as well as reviews of specific hardware or software and reports restricted to very specific geographic areas.

Organization of the Bibliography

This bibliography is divided into four major sections: **Computer Assisted Instruction—Overview Documents, Special Applications**, (i.e., those without a specific subject orientation), **Subject Applications, and Special Populations.**

The 24 documents selected for the first section, **Computer Assisted Instruction—Overview Documents**, provide general discussions of the topic and include conference papers, literature reviews, position papers, project descriptions, research reports, and teaching guides.

The second section, **Special Applications**, lists 15 categories, with the categories *Ethics* and *Proceedings* returning in this edition. This section includes: three documents on *Artifical Intelligence/Expert Systems;* five reports on *Cognitive Processing/Thinking Skills;* three items under *Computer Literacy;* 11 documents on

Computer Networks; six papers on *Computer Equity*, encompassing gender, socioeconomic, and sociocultural issues; one review on *Counseling and Guidance*; seven items on *Courseware and Software*, including research reports and software reviews; two position papers on *Ethics*; four documents on *Interactive Video*; one teaching guide on *Keyboarding*; nine papers on *LOGO*; 12 documents on *Management/Administration* of computing resources in schools; nine reports of *Research*; one project description on *Simulation*; and four papers on *Testing*.

The third section, **Subject Areas**, covers computer applications within specific disciplines. *Music* appears as a new category in this edition, and the categories *Fine Arts*, *Physical Education*, and *Programming* do not appear. This section includes: three items on *Business Education*; five papers on *English as a Second Language and Foreign Languages*; two reports on *Language Arts*; 26 items on *Mathematics*; two documents on *Music Education*; seven papers on *Reading*; 12 reports on *Science*; five documents on *Social Studies*; eight reports on *Vocational Education*; and 15 papers on *Writing Instruction*.

The final section addresses computer usage with **Special Populations** and includes eight reports on computer applications in *Adult Education*; 19 documents on *Disabled Learners*, including all types of disabilities; five items dealing with *Disadvantaged* populations, including at risk students; one project description on computer uses with *Gifted*; and four papers on *Preschool Education*.

Within each section, documents are listed alphabetically by personal author, editor, or corporate author. If no author is available, items are alphabetized by title.

There is some overlap between the sections in the subject matter covered, e.g., the section on *Mathematics* includes a document on at risk students; both *Mathematics* and *Science* contain documents on the use of interactive video or videodisks; some documents on *Adult Education* focus on teaching the basic skills and one lists courseware and software specifically for this group; and both interactive video and computer software are included in documents in the section on *Preschool Education*. Individual items have not been listed in more than one category, so users will want to check all related sections for information on a given topic.

We have continued our policy of spelling the term programming two different ways. It appears as PROGRAMING in the descriptor field, where this is the official spelling that should be used when searching that field, and as PROGRAMMING in the title and abstract fields, since that is the more prevalent spelling, and we feel that it is more apt to be used in free text searching.

Computer Assisted Instruction

Overview Documents

ED332318
Real Restructuring through Technology.
Ahearn, Eileen M.
Council for Basic Education, Washington, D.C.
Perspectives, v3 n1 Spr 1991
1991, 17p.
Available from: Publications, Council for Basic Education, 725 15th Street, N.W., Washington, DC 20005 ($2.00).
EDRS Price: MF01/PC01 plus postage.
Document type: Position Paper (120); Serial (022)
Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *Futures (of Society); *School Restructuring; *Technology

The premise of this paper is that the most important need in education today is the design of an appropriate role for computers and related technologies to profoundly change teacher roles and the structure of the educational system. The discussion describes how teachers can act as central agents for meaningful educational reform. Based on a new technology-based paradigm in which the teacher's role is management of a multiple learning source system, the teacher becomes an information resource and mentor. Advantages of using computer-based technology for educational restructuring include increased planning time for teachers, creation of an active student learning role, individualized learning that eliminates student placement systems, a focus on outcomes rather than input, and increased opportunities for professional growth. Making the restructured system a reality requires a view of schools in their social context, investment of the business sector, and substantial financial commitment. The first steps mandate the full involvement of teachers, leading to professionalization, and public and private collaborative funding.

ED332691
Junior High Computer Studies: Teacher Resource Manual.
Alberta Dept. of Education, Edmonton. Curriculum Branch.
1990, 255p.
Available from: Learning Resources Distributing Centre, 12360, 142 Street, Edmonton, Alberta, T5L 4X9 Canada.
EDRS Price: MF01/PC11 plus postage.
Document type: Teaching Guide (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Literacy; *Curriculum Development; *Learning Modules; *Microcomputers

This manual is designed to help classroom teachers in Alberta, Canada, implement the Junior High Computer Studies Program. The first eight sections cover the following material: (1) introduction to the teacher resource manual; (2) program rationale and philosophy; (3) general learner expectations; (4) program framework and flexibility; (5) program planning, use of time, and resources; (6) integration into other subjects; (7) learning resources; and (8) specific learner expectations. The next five sections contain 25 learning modules listed by theme (applications, keyboarding, productivity, programming, and society), each of which contains suggested student activities, integrated activities, and learning resources designed to meet specific learner expectations. The final four chapters discuss sample lesson plans; facilities, hardware, and software; evaluation; and program support resources. Supplementary instructional materials are appended and a glossary concludes the manual. The three programs on two computer disks that accompany the manual are not included in this document. (15 references)

ED327177
Report on the Effectiveness of Microcomputers in Schools.
Bialo, Ellen; Sivin, Jay
Software Publishers Association, Washington, DC.
1990, 25p.
EDRS Price: MF01/PC01 plus postage.
Document type: Position Paper (120)
Major Descriptors: *Academic Achievement; *Computer Assisted Instruction; *Interaction; *Student Motivation

The three reports in this collection are based on research reviews and original research from both published and unpublished sources, covering the years 1986 through 1990, and they reflect the broad array of factors that determine the effectiveness of technology-based instruction. The first report discusses research studying the effects of microcomputers on student achievement. Such studies compared computer-assisted instruction with more traditional instructional methods, and related student achievement to software design, learner characteristics, and implementation decisions. Research demonstrating the power of microcomputers and other educational technologies to motivate students and to improve their attitudes about learning and themselves is discussed in the second report. Finally, the effects of microcomputers on social interaction and relationships within the classroom are examined. Each study included in these reports is cited in the bibliography. (61 references)

ED323908
Education and Computers: Vision and Reality.
Carnoy, Martin; And Others
Stanford University, Calif. School of Education.
Sep 1987, 118p.
Sponsoring Agency: United Nations Educational, Scientific, and Cultural Organization, Paris (France).
Report No: ED/87/WS/37
EDRS Price: MF01/PC05 plus postage.
Document type: Position Paper (120)
Major Descriptors: *Computer Assisted Instruction; *Instructional Design; *International Programs; *Outcomes of Education

This report evaluates two arguments for the use of computers as an important tool in learning: (1) there is a need to develop the kinds of skills and knowledge that will allow youth to find good jobs in a changing, information-based national and international setting; and (2) computers are capable of improving the overall level of student achievement. Chapter 1 compares claims about computer education to actual outcomes, and examines the distribution of computers among nations, as well as the cost effectiveness of computers. Real-world applications of computers are reviewed in chapter 2 along with the issues surrounding computer use in education. Experts on computer education also provide insights on the use of computers in many countries of the world. Chapter 3 focuses on the effect of computer education on employment and skills, while chapter 4 assesses the effects of computers on learning and reviews the literature that measures the impacts on learning of different applications of computers in schools. Finally, the cost effectiveness of computer education is analyzed both in different configurations and when compared with alternative technologies. Initial conclusions based on the assessments made in this book include that: (1) there is little evidence that computers used for general education help individuals get better jobs; (2) there is little evidence that computers in schools help nations become more competitive; and (3) computers are more cost-effective than some technologies, and less so than others. An extensive bibliography is provided.

ED335152
Interactive Technology and the Young Child: Insights from Research and Design. Center for Learning Technology Reports and Papers in Progress, Report No. 90-2.
Char, Cynthia A.
Education Development Center, Inc., Newton, Mass.
[1990], 12p.; Paper based on presentation delivered at the Annual Conference of the American Educational Research Association (Boston, MA, April 16-20, 1990). Illustrations will not reproduce clearly.
Available from: Center for Learning Technology, Education Development Center, 55 Chapel Street, Newton, MA 02160 ($3.00).
EDRS Price: MF01/PC01 plus postage.
Document type: Review Literature (070); Position Paper (120)

Major Descriptors: *Computer Assisted Instruction; *Educational Technology; *Interpersonal Relationship; *Learning Activities; *Technological Advancement; *Young Children

This paper offers historical, present, and futuristic perspectives on the role of interactive technology in the lives of young children. In the early 1980s, debate tended to center on the question, "Are computers good for young children?" At the time, educational software consisted almost exclusively of animated drill and practice programs. Now, advances in software technology have resulted in more exploratory, open-ended software programs and tools and better guidelines for evaluating and designing developmentally appropriate software with features intended for 3- to 6-year-olds. In the future, researchers, designers and educators should assume a more active role in determining how technology might enhance young children's learning and development. Interactive technologies might offer children powerful tools and environments for: (1) creating multimedia compositions; (2) enhancing intuitive knowledge and decision-making processes; (3) extending mathematical exploration and problem solving; and (4) supporting social interaction, collaboration, and perspective. Several aspects of young children's use of computers are addressed that illustrate the ways in which technical developments in computer hardware could broaden our conceptions of young children's interactions with technology. A list of 21 references is included.

ED323993
The Best of Research Windows: Trends and Issues in Educational Computing.
Collis, Betty
International Society for Technology in Education, Eugene, OR.
1990, 105p.
Report no: ISBN-0-924667-66-4
Available from: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-9905.
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document type: Review Literature (070); Bibliography (131)
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Curriculum Development; *Educational Trends; *Media Research

This document provides: (1) a synthesis of more than 180 research studies cited in the "Research Windows" column that appeared in "The Computing Teacher" journal between 1985 and 1989, and (2) reprints of the columns themselves. In the synthesis section the studies are grouped into five general categories with various subheadings containing bibliographic references for that specific topic followed by a brief discussion. The categories are: (1) curriculum-related instructional support, i.e., the impact of computers in the traditional academic subject areas of language arts, mathematics, and science; (2) computer impact on other learning, with subtopics on database usage, preschool children and computers, Logo, programming (non-Logo), and computer science instruction; (3) software, which includes evaluation and design features such as graphics, types of feedback, and computer-controlled versus student-controlled issues; (4) teacher-focused studies, which include surveys of teachers' attitudes, issues related to teacher training, and factors affecting implementation of computers in the classroom; and (5) other topics, including cost-effectiveness studies, research summaries, and gender and computer use. A brief summary of overall trends concludes this section. Section two reproduces the actual "Research Windows" columns which are referenced in the first section.

ED327150
Computers in Schools and Universities in the United States of America.
Ely, Donald P.
31 Oct 1990, 14p. Paper presented at the International Meeting of the Association for the Development of Computer-Based Instructional Systems (San Diego, CA, October 28-November 1, 1990).
EDRS Price: MF01/PC01 plus postage.
Document type: Review Literature (070); Project Description (141); Conference Paper (150)
Major Descriptors: *Adoption (Ideas); *Computer Assisted Instruction; *Instructional Innovation; *Use Studies

The purpose of this paper is to describe four aspects of computer technology in education in the United States: (1) the number of computers available to students and teachers, the number of schools using software for word processing, drill and practice, educational games, and tutorials, and the number of journals and professional associations devoted to computers in education; (2) where computers are located and how they are used, and the social and vocational rationales behind computer use; (3) the im-

pact of computers in education; and (4) hypotheses about computer non-use, limited use, and inappropriate use, as well as conditions that hinder the implementation of instructional innovations such as computers. It is concluded that most students in most elementary and secondary schools have access to computers, albeit limited access, and there exists a genuine desire to integrate computers into the classroom; however, computers are most frequently used for word processing and least used for integrated subject-matter instruction, and the course most frequently taught using computers is computer literacy. It is noted that conditions for implementation are not always present in schools, and that there is no national plan or strategy for diffusing or gaining acceptance for this innovation for instructional purposes. (9 references)

ED325109
Effective Inservice for Integrating Computer-as-Tool into the Curriculum.
Franklin, Sharon, Ed.; Strudler, Neal, Ed.
International Society for Technology in Education, Eugene, OR.
1989, 193p. The accompanying Macintosh disk is not included in this document.
Sponsoring Agency: National Science Foundation, Washington, D.C.
Report No: ISBN-0924667-58-3
Available from: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-9905 (1-4 copies, $40.00 each prepaid).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document type: Teaching Guide (052); Non-Classroom Material (055)
Major Descriptors: *Computer Assisted Instruction; *Inservice Education; *Instructional Development; *Program Effectiveness; *Teaching Methods

This notebook is designed to help educators who are currently learning to design and present inservice programs, educators who are already inservice providers but who might benefit from an overview of inservice theory, and educators who are hiring, supervising, or evaluating inservice providers. It is divided into three parts: (1) Introduction and Background (a short computers-in-education course specifically designed for computer integrated instruction inservice facilitators); (2) Effective Inservice Practices (discussion of what is known about effective inservice and inservice for computer integrated instruction, including the Gall and Renchler report on inservice to promote basic skills, and a literature review focusing on effective staff development for computer integrated instruction); and (3) Evaluation (a variety of instruments for needs assessment, formative evaluation, and summative evaluation of an inservice). References are listed throughout the notebook.

ED332268
Learning Styles and Computers.
Geisert, Gene; Dunn, Rita
1990, 14p.
EDRS Price: MF01/PC01 plus postage.
Document type: Review Literature (070)
Major Descriptors: *Cognitive Style; *Computer Uses in Education; *Learning Strategies

Although the use of computers in the classroom has been heralded as a major breakthrough in education, many educators have yet to use computers to their fullest advantage. This is perhaps due to the traditional assumption that students differed only in their speed of learning. However, new research indicates that students differ in their style of learning as well—some preferring visual information; others, auditory or tactile. A new generation of computer software that can be tailored to a student's preferences has been developed, and its use in the classroom has yielded dramatic results. For instance, Thinking Networks has developed a program designed to help improve writing skills—skills that are notoriously poor among many students. By presenting nonverbal graphic images that symbolize semantic relationships, this program is immediately accessible to many visually-oriented students. The program also develops basic thinking operations, such as sequencing, organizing, comparing, and contrasting, and can be tailored to students' preferences in a number of other ways as well. Through the thoughtful use of computers and Computer Managed Instruction, technology can serve the needs of education in a way no other tool can.

ED328234
Who Needs Computers in Schools, and Why? CITE Report No. 73.
Hawkridge, David
Open University, Walton, Bletchley, Bucks (England). Institute of Educational Technology.
[1989], 13p.; Prepared by the Centre for Information Technology in Education.
EDRS Price: MF01/PC01 plus postage.
Document type: Position Paper (120)
Major Descriptors: *Computer Assisted Instruction; *Educational Strategies

This paper outlines and discusses four rationales for using computers in schools: (1) the social rationale, which states that it is necessary for children to become aware and unafraid of computers in order to prepare for life and work in an industrial society; (2) the vocational rationale, which states that children should learn computer programming and become generally computer literate; (3) the pedagogic rationale, which states that computer assisted instruction offers advantages over other teaching methods in subjects such as physics and art (among many others); and (4) the catalytic rationale, which states that computers help children become less dependent on the teacher as expert and will enable change in education to occur. Three additional rationales are also noted and discussed: the information technology industry rationale, the cost-effectiveness rationale, and the special needs rationale. It is concluded that priorities for using computers in schools are changing rapidly and should be further examined. (5 references)

ED332673
Computer-Assisted Instruction: A Review of the Literature.
Hillsborough County Schools, Tampa, FL. Department of Testing and Evaluation.
Florida Educational Research Council Research Bulletin, v21 n2 Fall 1988
1988, 43p.
Sponsoring Agency: Florida Educational Research and Development Council, Inc., Sanibel.
Available from: Florida Educational Research and Development Council, P.O. Box 506, Sanibel, FL 33957 ($3.00 each, or $10.00 annual subscription).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document type: Review Literature (070); Serial (022)
Major Descriptors: *Computer Assisted Instruction; *Media Research; *Program Evaluation

This review of the literature on computer-assisted instruction (CAI) addresses the following topics: background and scope of CAI; current research on software and learner variables; current research on microcomputers and other delivery systems; meta analyses of the effectiveness of CAI; and methods for evaluating CAI programs. It is concluded that although CAI is generally believed to have positive effects in learning, particularly in the area of computer literacy, current research fails to explain the educational strategies that cause these positive effects to occur. Additionally, computer software evaluation methods and program evaluation methods need to be developed in order to improve the use of educational technology in the classroom. (41 references)

ED329938
A Framework for the Contextual Analysis of Computer-Based Learning Environments. Technical Report No. 527.
Jacobson, Michael J.; Spiro, Rand J.
Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois University, Urbana. Center for the Study of Reading.
Apr 1991, 20p. Funded in part by the Army Research Institute Office of Basic Research.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document type: Position Paper (120); Evaluative Report (142)
Major Descriptors: *Computers; *Educational Environment; *Instructional Effectiveness; *Models

Addressing the need for a framework to distinguish the conditions under which different types of educational computing environments are productive, this paper proposes a cognitively based Contextual Analysis Framework consisting of two primary elements: (1) conceptual characteristics of the knowledge domain being learned, including the complexity of the concepts and tasks and the degree of orderly and regular conceptual structure of the knowledge domain; and (2) stage of learning (novice, advanced) of the learner within the knowledge domain. The paper analyzes the characteristics of different types of computer-based learning environments (such as computer-based drill, intelligent tutoring systems, hyper-

text) in terms of the Contextual Analysis Framework. The paper argues that the failure to consider important contextual elements of learning related to conceptual characteristics of the domain and the stage of the learner could result in otherwise well-designed instructional computing technologies being used in inappropriate learning situations. (Eight footnotes are included; 40 references are attached.)

ED334990
Educational Computing Social Foundations: A Symposium.
Knupfer, Nancy Nelson; And Others
1991, 53p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology;* see ED 334 969.
EDRS Price: MF01/PC03 plus postage.
Document type: Position Paper (120); Conference Paper (150)
Major Descriptors: *Computer Uses in Education; *Educational Change; *Educational Technology; *Teacher Education

An abstract introduces this collection of three papers and two abstracts of papers from a symposium at which experts presented their viewpoints about the social, political, and economic issues surrounding the use of computers in schools. Each of the following five investigations provides an important perspective on such issues: (1) "Educational Computing and Teachers: Changing Roles, Changing Pedagogy" (Nancy Nelson Knupfer); "Teachers, Computers, and Power" (Robert Muffoletto—abstract only); (3) "Economic, Political, and Social Issues That Affect the Growth of Distance Education" (Marina Stock McIsaac); (4) "The History' of Technology and Education" (Alfred Bork); and (5) "Educational Technology Curriculum Theory: Toward a New Language of Possibility" (J. Randall Koetting—abstract only). Two of the three papers provide references.

ED335355
Drills vs. Games—Any Differences? A Pilot Study.
McMullen, David W.
1987, 24p.
EDRS Price: MF01/PC01 plus postage.
Document type: Research Report (143)
Major Descriptors: *Computer Assisted Instruction; *Computer Games; *Drills (Practice); *Instructional Effectiveness; *Student Attitudes

This study investigated the effect of informational, drill, and game format computer-assisted instruction (CAI) on the achievement, retention, and attitude toward instruction of sixth-grade science students (N=37). An informational CAI lesson on Halley's Comet was administered to three randomly selected groups of sixth-grade students. A CAI drill about the content of the informational lesson was given to one group, and a CAI game was given to another group; only the informational lesson was presented to the third group. No significant differences were found between the groups on a posttest measuring achievement given immediately after the instruction or on a retention posttest given one month later. Students in the group receiving the CAI game did differ significantly from the other groups in their attitude about how much they had learned from the lesson.

ED332672
Images in Action. Learning Tomorrow: Linking Technology and Restructuring.
National Foundation for the Improvement of Education, Washington, D.C. [1991], 40p. For the report on Phase I, see ED 319 383.
Available from: National Foundation for the Improvement of Education Publications, PO Box 509, West Haven, CT 06519 ($4.00).
EDRS Price: MF01/PC02 plus postage.
Document type: Position Paper (120); Project Description (141)
Major Descriptors: *Computer Assisted Instruction; *Educational Practices; *Educational Technology; *Instructional Innovation
Identifiers: *Learning Tomorrow Project

Focusing on the use of advanced technologies in classrooms to reshape the educational environment in which students learn, this report on Phase II of the Learning Tomorrow program contains brief descriptions of the most promising educational practices submitted by teachers in response to two nation-wide calls for Innovation in Practice. The report begins with background image and two discussions: "Starting Points" and "Technology: A Catalyst for Restructuring." An outline of 12 common themes or elements of

alternative organization of education identified in Phase I ("Images of Potential") introduce descriptions of the 17 promising practices featured in this report: (1) Connections: the Cross-District Classroom; (2) Informed Students Make a Difference; (3) Channel Seven Kids News; (4) World 2000; (5) Learning in a Tech Room; (6) Agriscience with a Laptop; (7) MATEC for Success: Reaching At-Risk Students; (8) High Tech Art; (9) A New Language, a Proud Cultural Heritage; (10) Home and Hospital Learning Environments; (11) Cooperative Learning at West Anchorage High; (12) Kids Together: Writing across Grade Levels; (13) An Educational Role for Computer Games; (14) The Science Project Hotline; (15) Fairy tales from the Heart; (16) Forecasting the Future; and (17) The Future of History. Each description includes the school in which the practice took place, the grade level, the students involved, subject, technology required, and contact persons. Brief discussions of the educational trends and issues suggested by these practices conclude the report.

ED331492
Learner Decisions and Information Requirements in Computer-Based Instruction.
Okey, James R.; Jones, Marshall G.
Nov 1990, 9p. Paper presented at the International Conference of the Association for the Development of Computer-Based Instructional Systems (32nd, San Diego, CA, October 28-November 1, 1990).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Information Needs; *Learner Controlled Instruction; *Locus of Control

The purpose of this paper is to consider different kinds of actions learners may take during computer assisted instruction (CAI), and to examine the kind of information they need in order to exercise control over the instruction, i.e., information about their performance level, the organization of the content, the choices available to them and the consequences of making those choices, and what they are required to know. Techniques described for providing such information include: (1) content maps, so that learners can navigate their way through content sequence; (2) computer graphics that depict achievement of outcomes; (3) clocks that portray the amount of time spent; and (4) text that conveys the degree of mastery. Other techniques used govern non-content based information, such as switching menus or exiting the program, and dictate the type of feedback the learner will receive. Hypermedia programs are used to illustrate how this information can be communicated to learners to promote intelligent and effective learner control in CAI. It is noted that some learner controlled instruction has the potential to lose learners in too much detail and too many layers. Thus, course organization and programming must be constructed with the learner's information needs in mind. (7 references)

ED329586
Research Based Guidelines for Computer Based Instruction Development.
Overbaugh, Richard C.
Feb 1991, 37p. Paper presented at the Annual Meeting of the Eastern Educational Research Association (14th, Boston, MA, February 13-17, 1991).
EDRS Price: MF01/PC02 plus postage.
Document type: Non-Classroom Material (055); Conference Paper (150)
Major Descriptors: *Authoring Aids (Programing); *Computer Assisted Instruction; *Courseware; *Guidelines; *Research Utilization; *Theory Practice Relationship

Guidelines are presented for the development of computer-based instructional materials. Steps in courseware development defined by M. D. Roblyer (1988) include: (1) instructional design; (2) preprograming development; and (3) programing. The emphasis is on instructional design, the most time-consuming part of the task. Preprograming development and the actual programing convert the planning to courseware. The first step in instructional planning involves identifying overall instructional content, objectives, and conditions of the course. Once a general course sequence (such as elaboration, inquiry learning, or discovery learning) is identified, task analysis can begin to identify: learning hierarchy; student model; and instructional environment. The second phase of instructional design includes developing individual lessons based on the parameters from the first phase. The instructional set is designed, and teaching strategies are determined. Performance eliciting and assessing is a third step, which must include effective techniques for providing appropriate feedback. The fourth step involves consideration of issues specific to computer-based instruction, such as: learner control; anxiety reduction; cuing; mnemonics; and personalization. A 48-item list of references is included.

ED327536
L.I.T.E. the F.I.R.E. (Learning, Information, Technology, Evolution For Improved, Revitalized, Education).
Rodgers, Robert J.
Nov 1990, 14p. Paper presented at the Annual Conference of the National Council of States on Inservice Education (15th, Orlando, FL, November 16-20, 1990).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150); Review Literature (070)
Major Descriptors: *Computer Oriented Programs; *Educational Technology *Instructional Design; *Multimedia Instruction; *Program Costs; *Technological Advancement

This paper discusses changes in educational content and methodology brought about in response to the needs of the present technology-driven information age. The use of word processing, databases, and spreadsheets is explained in relation to the promotion of higher order thinking skills. The increased amount and graphic nature of information as well as the increased role of the media center are discussed. The proper infusion of technology into education is seen as a slow evolutionary process for the following reasons: (1) the development of technology itself is an evolutionary process; (2) the cost of technology overburdens educational budgets; and (3) it takes time to implement programs and provide inservice. Nine strategies to overcome the obstacle of costs are listed. Because this is a technological age, new or revised curricula should include the use of appropriate technology that will help students learn how to learn.

ED327157
Learning with Computers: Effective Teaching Strategies.
Ryba, Ken; Anderson, Bill
International Society for Technology in Education, Eugene, OR.
1990, 105p.
Report No: ISBN-0-924667-64-8
Available from: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403.
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Educational Strategies; *Thinking Skills

The purpose of this guide is to explain how to use computers to promote the development of effective learning and thinking skills. The emphasis in this discussion of computer assisted instruction is on the social side of learning rather than the technical aspects of using computers. Chapter titles are: (1) "A Strategies Approach to Effective Learning and Thinking"; (2) "The Role of the Teacher in a Computer Strategies Approach"; (3) "Strategies for Teaching Thinking Skills with Computers"; (4) "Strategies for Teaching Social Skills in the Computer Environment"; (5) "LOGO and the Development of Thinking Skills"; (6) "Adventure Games and Thinking Skills"; (7) "Word Processing and Thinking Skills"; (8) "Computer Communications and the Development of Thinking Skills"; (9) "Databases and Effective Thinking"; and (10) "Spreadsheets as Tools for Thinking." Citations for additional readings from "The Computing Teacher" are also provided. (87 references)

ED322900
Accomplished Teachers: Integrating Computers into Classroom Practice.
Sheingold, Karen; Hadley, Martha
Center for Technology in Education, New York, NY.
Sep 1990, 41p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
Available from: Center for Technology in Education, Bank Street College of Education, 610 West 112th Street, New York, NY 10025 ($5.00).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document type: Position Paper (120); Research Report (143)
Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *Use Studies

This report summarizes the results of a nationwide survey of teachers in grades 4 through 12 who are experienced and accomplished at integrating computers into their teaching. Of 1200 teachers who were sent the 16-page questionnaire, 608 returned completed surveys. The purpose of studying these teachers was to discover the ways in which they use computers in their classrooms, whether and how they believe their teaching has changed as a result of using computers, and the kinds of barriers and incentives that

are important to them. Major findings show that these teachers: (1) are comfortable with computer technology, devote their own time to learning how to use computers, and receive local support for using them; (2) work in schools averaging more than twice the number of computers than other schools; (3) use computers for many purposes including demonstrating an idea, instruction, word processing, and promoting student-generated products; and (4) expect more from their students, are able to present more complex materials to their students, and foster more independence in the classroom. It is concluded that similar accomplishments on a wider scale may be achieved if ample technology, support, and time for teachers to learn the technology is provided, and if an academic and cultural structure exists to encourage teachers to take an experimental approach to their work.

ED334262
The Relation between Problem Areas and Stages of Computer Implementation.
ten Brummelhuis, Alfons; Plomp, Tjeerd
Apr 1991, 22p. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, April 3-7, 1991).
EDRS Price: MF01/PC01 plus postage.
Document type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Uses in Education; *International Studies; *Problems; *Program Implementation

Using data from an international comparative study on the use of new technologies in education in about 22 countries, an assessment of the relation between problem areas and stages of computer implementation was undertaken. The study—"Computers in Education" (COMPED)—has been conducted since 1987 by the International Association for the Evaluation of Educational Achievement (IEA). The COMPED assesses national policies regarding the goals of computer education and the actual use of computers, school plans and implementation of plans, experiences and opinions of teachers, and the effect of innovations at the student level. National policy, school policy, and teacher questionnaires are used to collect data on both elementary and secondary educational levels. Exploratory and contrast analyses were performed on study data. Results indicate that the most important problems of computer users are, at the same time, the most important reasons given by non-users for non-use. The problems with implementing computer technology in education, experienced by principals, computer coordinators, and teachers, are related to conditional factors, such as lack of hardware, software, knowledge, and time. The most important differences between schools with low and high levels of computer use are associated with organizational problems. Six tables are included.

ED333861
A Survey of Microcomputer Utilization for Purposes of Classroom Assessment.
Terwilliger, James S.
[1990], 8p.
EDRS Price: MF01/PC01 plus postage.
Document type: Research Report (143); Test, Questionnaire (160)
Major Descriptors: *Computer Assisted Testing; *Computer Software; *Computer Uses in Education; *Teacher Developed Materials; *Test Items; *Use Studies

This study was intended to establish "base-line" data with respect to teacher utilization of available microcomputer software for the purposes of: (1) generating teacher-made appraisals; (2) scoring/analyzing teacher-made appraisals; and (3) assigning and recording grades. Differences in reported utilization at the K-4, 5-8, and 9-12 grade levels were also examined, and an estimate was made of the use of various microcomputer systems in MECC (Minnesota Educational Computing Consortium) member schools. A sample of 300 schools was selected from the MECC national membership mailing list, and survey forms were mailed to the contact person named on the MECC mailing list. Responses were received from 217 schools (72%) in 40 states; the number of responses per state varied from 1 to 35. Respondents were asked to estimate the percentage of teachers in their school district using microcomputers for the three specified purposes. Results of the survey reveal that classroom teachers make relatively little use of microcomputers to generate or score/analyze teacher-made appraisals. Although greater numbers of teachers were using computers in assigning and recording grades, only half of the respondents indicated that this practice was employed by more than 10% of the teachers in their school district. It was found that teachers at grade levels K-4 use computers much less frequently than teachers at higher grade levels across all three applications, while teachers at levels 9-12 used computers with the greatest frequency. Apple computers were found to be almost universally available (99%), followed by Macintosh (65%), and IBM/IBM compatible (63%). It is concluded that the development of inservice workshops and training

programs for teachers that demonstrate the use of software for testing could result in both a reduction of teacher time and effort and an enhancement of the quality of classroom assessment procedures. A copy of the survey form is appended. (8 references)

ED335344
The Computer and Education. What Research Says to the Teacher, Second Edition.
Tolman, Marvin N.; Allred, Ruel A.
National Education Association, Washington, D.C.
1991, 43p.
Available from: NEA Professional Library, P.O. Box 509, West Haven, CT 06516 (Stock No. 1090-6-00, $3.95).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document type: Review Literature (070)
Major Descriptors: *Classroom Techniques; *Computer Assisted Instruction; *Computer Software; *Computer Uses in Education; *Microcomputers

The purpose of this monograph is to provide useful guidelines for teachers and to review findings in the literature with respect to the positive instructional value of computers in the classroom. Following an introduction, research findings are organized into seven topics: (1) Availability and Use: past availability and use, current availability and primary uses of microcomputers; (2) Classroom Applications: computer assisted instruction, computer managed instruction, testing, record keeping, and instructional games; (3) Curricular Applications: language arts, mathematics, science, and social studies; (4) Exceptional Children; (5) Attitude and Motivation; (6) Large Computer Systems: PLATO and TICCIT; and (7) Issues and Concerns: videodisc, compact disc, multimedia, software, quality of research, relationship with industry, networking, teacher training, computer coordinators, and effect on formal education. A conclusion discusses the encouraging indicators of computer use as well as some existing problems and concerns. A 115-item bibliography is included.

ED323961
Technology in Today's Schools.
Warger, Cynthia, Ed.
Association for Supervision and Curriculum Development, Alexandria, VA.
1990, 213p.
Report No: ISBN-0-87120-169-0
Available from: Association for Supervision and Curriculum Development (ASCD), 225 North Washington Street, Alexandria, VA 22314 (ASCD Stock No. 611-90085, $16.95).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document type: Collection (020); Non-Classroom Material (055)
Major Descriptors: *Computer Assisted Instruction; *Educational Technology; *Instructional Improvement

The 18 papers in this collection describe approaches that practitioners and experts have found successful in using technology as a tool to improve learning. Individual chapters are: (1) "Where Do We Go Now That the Power's On?" (Frank Withrow); (2) "A Curriculum for the Information Age" (Mary Alice White); (3) "Developing Technology Applications for Transforming Curriculum and Instruction" (Charles Mojkowski); (4) "A Model for Making Decisions about Computer and Technology Implementation" (Gregory Sales and Michael Damyanovich); (5) "Keyboarding: A Necessary Transitional Skill" (Gilbert Valdez and Sue Sollie); (6) "Interactive Information Systems" (Frank Withrow); (7) "Using Computer-Assisted Instruction To Support Learners" (Glenn Crumb); (8) "On-Line Computer Databases in School Library Media Centers" (Carol Kuhlthau and Joyce Sherman); (9) "Telecommunications: Using Phone Lines in the Classroom" (Denis Newman); (10) "Science in Problem Solving" (Roy Unruh); (11) "Computers and Writing: The Inevitable Social Context" (Andee Rubin); (12) "A Personal Account of Computer Use and Humanities Teaching" (Benjamin Thomas); (13) "'Storylords': Decisions in the Creation of an Instructional Television Series" (Thomas DeRose and Martha Deming); (14) "Integrating Technologies To Enhance Learning in Science and Math" (Regan McCarthy); (15) "Learning Dramas: An Alternative Curricular Approach to Using Computers with At-Risk Students" (Stanley Pogrow); (16) "Technology in Early Childhood" (Barbara Bowman); (17) "Curriculum Development for Gender Equity in Computer Education" (Kay Gilliland); and (18) "Program Descriptions" (Cynthia Warger). A list of the authors with their professional affiliations is included.

Special Applications

Artificial Intelligence/Expert Systems

ED322879

The Role of Human Intelligence in Computer-Based Intelligent Tutoring Systems.

Epstein, Kenneth; Hillegeist, Eleanor

17 Apr 1990, 20p. Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16-20, 1990).

EDRS price: MF01/PC01 plus postage.

Document Type: Position Paper (120); Project Description (141); Conference Paper (150)

Major Descriptors: *Computer Assisted Instruction; *Programed Tutoring; *Teacher Role

An Intelligent Tutoring System (ITS) consists of an expert problem-solving program in a subject domain, a tutoring model capable of remediation or primary instruction, and an assessment model that monitors student understanding. The Geometry Proof Tutor (GPT) is an ITS which was developed at Carnegie Mellon University and field tested in the Pittsburgh Public Schools. A version of the GPT for the Apple Macintosh microcomputer which was beta tested at Gallaudet University—and is still in use there in regular geometry classes—is a tutor rather than a primary instructor. It differs from the original GPT in that it does not contain a model of the domain of geometry and an expert geometry proof solver, and it restricts the students' explicit problem-solving to bottom up strategies. In this version, proofs developed by the original GPT are captured on a database and used by the MAC GPT in the form of expert solutions to which the system can refer. The following insights were gained during the test period: (1) since the teacher—rather than GPT—is responsible for teaching the fundamentals of geometry, the teacher's role is defined as providing necessary prerequisite knowledge; (2) the GPT provides effective guided practice for stronger students, which allows the teacher to work individually with those requiring more help; (3) teachers must facilitate the applications of new skills to different kinds of problems as the GPT cannot generalize outside of its own functions; and (4) although the GPT does not directly assess student performance, it has influenced the way teachers conduct student assessments, in particular, the level of detail now evident in student learning activities. While there remains a controversy over the role of humans in computer-assisted classrooms, it is concluded that the ITS will continue to offer teachers more freedom and creativity in their teaching as they begin to understand how they can subtly control the instructional environment to increase its effectiveness.

ED329997

The Metaphor of the Mind-as-Computer: Some Considerations for Teachers.

Gozzi, Raymond, Jr.

Mar 1991, 10p. Paper presented at the Annual Meeting of the Conference on College Composition and Communication (42nd, Boston, MA, March 21-23, 1991).

EDRS price: MF01/PC01 plus postage.

Document Type: Conference Paper (150); Position Paper (120)

Major Descriptors: *Artificial Intelligence; *Computers; *Language Role; *Metaphors

A metaphor and ongoing debate of the information age is that the mind is a computer or that, conversely, the computer has a mind. Since the debate is conducted using anthropomorphic metaphors such as "intelligent," "memory," and "friendly" (terms from humanity), the language itself pressures the discussion towards the conclusion that computers will surpass humans. In discussing the potentials of future computers, people are really just exploring the implications of their metaphors. For example, they say that the "intelligent" computer will someday "understand" natural language. The use of metaphor prompts people to make exaggerated claims for the computers, and these claims are taken seriously. Computers are ideal or even preferable for tasks which do not require insight or intuition—tasks that are performed by following a set of procedures, although no computer can match the range of awareness of the human mind. Teachers and students need to be aware of the implications of the metaphorical language which is used to describe computers, and the consequent effect of this language on their philosophy. It would be useful to discuss the capabilities of computers in a more appropriate technical language.

ED329224
Expert Systems in Education.
Hartschuh, Wayne
Nov 1990, 10p.
EDRS price: MF01/PC01 plus postage.
Document Type: Position Paper (120)
Major Descriptors: *Expert Systems; *Programed Tutoring

This paper argues that the concepts and techniques used in the development of expert systems should be expanded and applied to the field of education, particularly in the area of intelligent tutoring systems. It is noted that expert systems are a well known area of artificial intelligence and have been proven effective in well-defined topic areas. Furthermore, it is suggested that expert systems could have an impact on: (1) educational planning and decision making, particularly the use of computers to manage student records, student counselling, and special education programs; (2) teacher training and education, specifically, identifying training needs and using computer assisted instruction to teach information and skills; and (3) intelligent tutoring systems that guide students through instruction according to their individual strengths and weaknesses. It is concluded that while expert systems in education have great potential, they remain unestablished as a useful technology due to a lack of research and documentation. (9 references)

Cognitive Processes and Thinking Skills

ED332865
An Analysis of Metacognitive Skills Utilized by Students during Computer Simulation Activities.
Horak, Willis J.
Apr 1991, 10p. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (Lake Geneva, WI, April 7-10, 1991).
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150); Research Report (143)
Major Descriptors: *Computer Assisted Instruction; *Metacognition; *Problem Solving; *Secondary School Science; *Simulation

Metacognitive skills may be defined in a variety of ways. Generally, these ways all apply to people's thinking about their own personal thinking. This research study analyzed students' interactions to computer programs to assess their metacognitive skills. The metacognitive skills assessed were: (1) planning a course of action; (2) monitoring the outcomes; (3) evaluating data collection strategies; (4) thinking about or listing alternative strategies; (5) revising strategies; and (6) prioritizing actions. The participants were observed individually or in pairs during their work on specific programs. The participants were observed during each interaction and a record was kept of their verbal behavior and of their computer responses. Overall, subjects varied widely in their ability to choose a course of action. The subjects sometimes would sit and appear to consider what to do before they attempted the problem. Subjects were more capable of monitoring the outcomes of their decisions when they had had some positive experiences with this strategy. Revising strategies was most difficult. The subjects were not able to prioritize their actions.

ED323938
Effects of Different Loci of Instructional Control on Students' Metacognition and Cognition: Learner vs. Program Control.
Lee, Miheon J.
Feb 1990, 41p. In: *Proceedings of Selected Paper Presentations at the Convention of the Association for Educational Communications and Technology*; see ED 334 969.
EDRS price: MF01/PC02 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Cognitive Processes; *Computer Assisted Instruction; *Intermode Differences; *Learner Controlled Instruction; *Locus of Control; *Metacognition

This study of 24 third-grade students learning Logo had 3 major research goals: (1) to compare the effects of learner control with those of program control on students' metacognition, knowledge acquisition, and knowledge application, with total subjects; (2) to extend the comparison between learner control and program control by classifying the total learner control group into two groups according to whether the

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students make active or passive use of control options, and making comparisons between each of the two learner control groups and the program control group; and (3) to investigate whether results of comparisons between learner control and program control change in relation to students' different levels of prior knowledge of mathematics concepts related to those in Logo. Both groups were introduced to basic Logo commands with definitions, rules, examples, and practice. Students in the learner control group were free to decide whether and how often they needed to review some of the instructional components relative to a practice item, or to skip the review, while the other group received externally controlled computer-assisted instruction in which all control in the lessons was regulated by the program on the basis of predesigned rules. With various supportive variables factored in, the results indicated that learner control seemed to foster students' metacognitive as well as cognitive abilities in a more effective way than program control, regardless of different levels of prior background knowledge of a related subject. Data tables and additional information on the study are presented in three appendixes. (46 references)

ED334993
Metacognitive and Cognitive Effects of Different Loci of Instructional Control.
Lee, Miheon Jo
1991, 28p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology*; see ED 334 969.
EDRS price: MF01/PC02 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Cognitive Development; *Computer Assisted Instruction; *Learner Controlled Instruction; *Learning Strategies; *Locus of Control; *Metacognition

This study investigated different loci of instructional control and prior background knowledge in terms of two aspects of metacognitive effects (utilization and correctness of metacognitive monitoring) and two aspects of cognitive effects (knowledge acquisition and application). The study also investigated the effectiveness of learner strategies used under learner control. Two parallel versions of computer assisted instruction (CAI) lessons on the computer programming language Logo were developed for the program control and learner control groups. The two versions were the same in the tutorial sessions, but differed in the presentation of the question for self-estimates of understanding and in the choices available in the practice sessions. The subjects were 62 third graders in a suburban elementary school who had no prior experience with Logo, and the study was conducted in the school computer lab over seven weeks. When supportive factors such as provision of clearly labeled options, basic requirements, and presentation of feedback and advice on on-going progress were integrated into the design of a learner control study, this condition seemed to foster students' metacognitive as well as cognitive knowledge and skills in a more effective way than did program control. The overall results of the study indicate that, as an instructional design strategy, learner control can provide learners with opportunities to improve their metacognitive skills and knowledge, while attempting to teach cognitive skills and knowledge of specific subject matter content in a more effective way than can program control. Limitations of the study are noted, and nine tables, copies of the pretest and the interview schedule for metacognitive monitoring, and formulas for the evaluation of the effectiveness of learner strategy are appended. (27 references)

ED331842
Effects of Computer Programming on Students' Cognitive Performance: A Quantitative Synthesis.
Liao, Yuen-Kuang Cliff
[1990], 41p.
EDRS price: MF01/PC02 plus postage.
Document Type: Research Report (143)
Major Descriptors: *Cognitive Ability; *Effect Size; *Performance Factors; *Programing

A meta-analysis was performed to synthesize existing data concerning the effects of computer programing on cognitive outcomes of students. Sixty-five studies were located from three sources, and their quantitative data were transformed into a common scale—Effect Size (ES). The analysis showed that 58 (89%) of the study-weighted ESs were positive and favored the computer programing group over the control groups, while seven (11%) of the study-weighted ESs were negative and favored the non-programing group. The overall grand mean of the study-weighted ESs for all 432 comparisons was 0.41, suggesting that students having computer programing experiences scored about 16 percentile points higher on various cognitive ability tests than did students who did not have programing experiences. In addition, 14 of the 28 coded variables selected for this study (e.g., type of publication, grade level, language studied, and duration of treatment) had a statistically significant impact on the mean study-weighted ES. The findings suggest that the outcomes of learning a computer language go beyond the content of that

specific computer language. The results also illustrate a mildly effective approach for use by instructors for teaching cognitive skills in a classroom setting. Four tables and one graph illustrate the analysis. A 79-item list of references is included.

ED329220
Developing Computer Tools To Support Performing and Learning Complex Cognitive Skills. A RAND Note.
McArthur, David
Rand Corp., Santa Monica, Calif.
Jul 1989, 22p.
Sponsoring Agency: National Science Foundation, Washington, D.C.
Report No: RAND-N-2980-NSF
EDRS price: MF01 plus postage. PC not available from EDRS.
Document Type: Position Paper (120); Project Description (141)
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Problem Solving; *Thinking Skills

The main aim of this paper is to demonstrate that new and highly effective computer-based learning tools can be designed by adhering to a simple principle: Good learning tools conform to and support the processes and structures that comprise learning. The paper first discusses the processes involved in learning cognitive skills, then describes several software tools that support and facilitate these skills. The examples discussed are drawn from learning problem-solving skills in high school algebra, and learning how to play the strategic board game of Go. Although some of the tools described embed considerable complex intelligence, many are relatively simple to implement and are easily within the current state of the art of computer hardware and software. (16 references)

Computer Equity

ED327389
Gender Differences in the Attitude, Interest and Participation of Secondary Students in Computer Use.
Arenz, Bernard W.; Lee, Miheon J.
1990, 68p. Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16-20, 1990).
EDRS price: MF01/PC03 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Uses in Education; *Females; *Secondary School Students; *Sex Differences; *Student Participation

The lower level of participation of females in computer science courses is a continuing concern for educators. A number of different reasons for this lack of participation have been put forward, including differences in attitudes, bias, role models, differential treatment by classmates and teachers, patterns of computer use, availability of computers and their associated subject areas. This series of studies, conducted over a three year period, examines potential factors affecting computer course participation by males and females in middle and high school grades. Differences in role models, attitudes, interest and computer use between gender as well as within gender were found to exist which may contribute to a continuing stereotype of computers as a male domain.

ED323995
Yes, I Can: Action Projects To Resolve Equity Issues in Educational Computing. A Project of ECCO, the Educational Computer Consortium of Ohio.
Fredman, Alice, Ed.
International Society for Technology in Education, Eugene, OR.
1990, 92p.
Sponsoring Agency: BP America, Cleveland, OH.
Report No: ISBN-0-924667-71-0
Available from: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-9905.
EDRS price: MF01 plus postage. PC not available from EDRS.

Document Type: Collection (020)
Major Descriptors: *Computer Assisted Instruction; *Educational Discrimination; *Equal Education; *Microcomputers; *Minority Groups; *Sex Differences

This book presents reports on selected "local action" projects that were developed as part of the Equity in Technology Project, which was inaugurated in 1985 by the Educational Computer Consortium of Ohio (ECCO). The book is organized into three sections, one for each of the populations targeted by the project. An introduction by Alice Fredman discussing the equity issue in general and overviews, also by Fredman, of the inequity potential for each of the three target populations addressed introduce the reports. The first two reports focus on girls; their titles are: "E(P) = ERG (Potential Energy = Enrichment Readiness for Girls: A Science/Computer Project for Sixth- and Seventh-Grade Girls" (T. Koontz); and "Sex Equity in Computer Education: An Enrichment Program for Seventh- and Eighth-Grade Girls" (J. Elliott). Minorities and economically disadvantaged students are the focus of the next three reports: "Equity Projects in Inner-City Schools: Working Together in Word Processing" (M. J. P. Boback and others); "Communicating with Computers: A Telecommunications Project" (V. J. Browsh, D. Hatfield, and J. M. Morgan); and "Using the Computer To Increase Academic, Vocational, and Social Skills of Junior High Occupational Students" (A. Fazzini). The last three reports focus on students with disabilities: "Computer Usage by Children with Learning Disabilities: An Exploration with First- and Second-Grade Students" (L. de la Pena); "The Write Way: A Language Arts Program for Orthopedically Handicapped Students" (L. Kuchmaner); and "Hands On—A Training Model for Peer Tutors" (M. Rosenshein). Learning activities, work sheets, a student survey questionnaire, and evaluation form for teachers are included in the project descriptions, and bibliographies of both the literature and relevant software are provided.

ED331481
Computers and Paideia: The Cultural Context or "Compupaideia" of Computer Assisted Learning.
Makedon, Alexander
May 1989, 8p. Paper presented at the International Conference on Computer Assisted Learning (2nd, Dallas, TX, May 9, 1989).
EDRS price: MF01/PC01 plus postage.
Document Type: Evaluative Report (142); Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Cultural Context; *Educational Sociology

Taken from the terms "computer" and "paideia," the term "compupaideia" refers to the cultural context of computer assisted instruction (CAI) and computer assisted learning (CAL). The question may be raised, what is the cultural context that made CAI desirable, and how does one determine whether CAI is well suited to a particular culture? The answers to these questions may be found by reviewing the research on computer based instruction, and by examining educational environments and educational sociology. For example, if a student sometimes fails to learn, the cause may be because of a failure to understand that student's cultural traits, characteristics, and background. Compupaedia deals with culture-sensitive CAI programs, and recognizes its importance in a pluralistic society where people of diverse cultural backgrounds must learn successfully in standardized educational contexts. Rather than provide guarantees for success, compupaedia simply suggests that culture, too, may be an important variable in the design of instruction. (15 references)

ED322896
Making the Computer Laboratory Accessible to Minorities.
Martin, Robert
6 Feb 1990, 16p. Paper presented at the Annual Meeting of the Association of Teacher Educators (70th, Las Vegas, NV, February 6, 1990).
EDRS price: MF01/PC01 plus postage.
Document Type: Review Literature (070); Position Paper (120); Conference Paper (150)
Major Descriptors: *Computer Uses in Education; *Equal Education; *Females; *Minority Group Children; *Use Studies

Research literature shows that current uses of computers in public school education are not reaching minority populations, and that females and ethnic minority students are less likely to have access to a computer at home. In addition, a study of computer use in the Learning Skills Center (LSC) at the University of Alabama supported the research finding that computer laboratories in schools are both supervised and used primarily by white males. A study of computer use in a small open-use computer laboratory in the Tuscaloosa Public Library showed that 63% of the children in a day camp program who checked out computer programs during free library time were male; the sample was not sufficiently racially diverse

to make white/minority comparisons. Potential solutions to these problems include: (1) the hiring of minorities as computer instructors; (2) integration of computer applications courses into the regular secondary school curriculum; and (3) teacher training in computer use, teacher access to available software, and assistance for teachers who wish to modify the curriculum to incorporate computer use. (11 references)

ED322897
Promoting Equity through Educational Technology Networks.
Salehi, Saeed; And Others
Maryland State Dept. of Education, Baltimore.
Apr 1990, 57p. Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16-20, 1990).
EDRS price: MF01/PC03 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Uses in Education; *Equal Education; *Information Networks; *Minority Group Children

In many school districts throughout the country, the unplanned and inequitable distribution of computers has tended to widen the gap between advantaged and disadvantaged, male and female, and majority and minority students. One of the missions of the Maryland State Department of Education (MSDE) is the task of achieving equality of educational opportunities for all students within the state. With this in mind, MSDE, local education agencies in Maryland, and computer hardware and software vendors initiated a collaborative instructional support project called the Maryland Education Technology Network (METN) to provide equitable distribution of computer technology and access to educational support for schools that lacked these resources. Results of three years of evaluation studies of the METN project show a steady increase in the number of schools served by a network-computer center, positive student attitudes toward computerized instruction, and positive teacher attitudes toward using computers for instructional support and as instructional tools. The copy of the 60-item computer-using teacher survey that is provided includes a tally of the responses for each question. (5 references)

ED335025
Sociocultural Aspects of Computers in Education.
Yeaman, Andrew R. J.
1991, 6p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology*; see ED 334 969.
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Cultural Context; *Microcomputers; *Resistance to Change; *Socioeconomic Influences

The data reported in this paper gives depth to the picture of computers in society, in work, and in schools. The prices have dropped but computer corporations sell to schools, as they do to any other customer, to increase profits for themselves. Computerizing is a vehicle for social stratification. Computers are not easy to use and are hard to learn to use well. Schools play an important role in transmitting knowledge about how to use computers and by that increase sales and the rate of adoption. Workers and teachers object to the innovation in part because of design problems; computers do not always work well, are not always useful and can be a hindrance to getting things done. Some schools may be squandering money on computers instead of spending it on needed supplies. Where the quality of education was once rated on the ratio of teachers to students, it is now rated on the ratio of computers to students. (19 references)

Computer Literacy

ED328351
Achieving Student Mastery Learning of Fifth Grade Minimal Standards for Computer Literacy through the Development and Use of a Computer Literacy Program.
Dafeldecker, Cheryl Temple
Jun 1987, 36p. Master's Practicum, Nova University.
EDRS price: MF01/PC02 plus postage.
Document Type: Practicum Paper (043)
Major Descriptors: *Computer Literacy; *Curriculum Development; *Elementary School Students; *Elementary School Teachers; *Inservice Teacher Education

A teacher in gifted education implemented and evaluated a 9-week practicum intervention designed to: (1) produce computer literacy materials that would enable fourth and fifth graders to meet minimal standards for computer literacy in Florida; and (2) produce corresponding in-service materials for teachers. A teacher's manual was developed from county materials and other public domain materials on computer instruction. The manual correlated materials and activities to minimal standards, and organized them in a logical, teachable progression. A student's booklet was compiled from the activities and materials in the teacher's manual. Included were activity sheets; cut-and-paste pages; and informative pages on terms, procedures, and facts. Two 45-minute in-service sessions were conducted with participating teachers. After teachers had mastered the minimal standards, the program was implemented in classrooms. Target teachers were asked to teach the computer literacy program at least twice a week for 30 minutes per lesson. Evaluation data revealed that 55 of 181 target students achieved a posttest score of 80 percent or better. Teachers improved significantly in knowledge of computers. Measures and instruments are appended.

ED331496
Cultural Literacy and Computer Literacy: Cautions for the Third World.
Palmer, Janet J.
Jul 1990, 11p. Paper presented to the World Conference on Computers in Education (5th, Sydney, Australia, July 9-13, 1990).
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Literacy; *Cultural Awareness; *Developing Nations

To prepare students for the Information Age, many developing nations provide courses in computer literacy. While computers can teach more efficiently and effectively than traditional methodologies, developing nations need to be aware of the effect of computer literacy on cultural awareness and cultural literacy. Computers, as language-based devices, can select, amplify, reduce, and even eliminate, elements of a society's culture, because they themselves are influenced by culture. Solutions to this computer-cultural literacy problem include reassessing the role of the teacher in an electronic classroom, examining the rationale behind the use of computer assisted instruction, and using multicultural versions of computer software and hypermedia. (9 references)

ED333859
Computer Confidence: A Factorial Model for the Prediction of Success in an Introductory Computer Class for Preservice Teachers.
Poage, Julie A.
Apr 1991, 10p. Paper presented at the Annual Conference of the American Educational Research Association (Chicago, IL, April 3-7, 1991).
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143); Test, Questionnaire (160); Conference Paper (150)
Major Descriptors: *Computer Literacy; *Education Majors; *Factor Analysis; *Preservice Teacher Education; *Self Esteem

As education students are faced with the inevitable arrival of computers in classrooms they experience a number of obstacles preventing success in introductory computer classes. The basis for this study suggests that the overwhelming factor contributing to success in such a class is confidence. One hundred fourteen undergraduate education students were surveyed. Each student was asked to report his or her level of agreement to 20 Likert-style items. The final 16-item confidence scale obtained a standardized alpha of .7820. A principle components factor analysis with oblique rotation provided a comparison be-

tween four, five, and six factor solutions. It was concluded that the 5-factor model presented the best fit and most parsimonious structure. Using factor scores from the 5-factor solution as independent variables and teacher-rated computer class success as the dependent variable, a regression analysis yielded an R square of .319, F(5,108)=2.539(p.05), thus concluding that the 5-factor solution of confidence contributed significantly to the rated success of students in the introductory computer class. The five factors are identified as (1) confidence in classroom performance; (2) confidence in abilities to learn new materials or techniques; (3) confidence in hardware usage and repairs; (4) confidence in knowledge of content area subject matter; and (5) confidence in abilities to learn using alternative learning styles. A copy of the Computer Confidence Survey is appended. (7 references)

Computer Networks

ED327166
Development of a Computer Program To Improve Sixth Graders Use of a Local Area Network.
Castoldi, Shirley S.
May 1988, 86p. Educational Specialist Practicum Report, Nova University. Some lines of code in program are illegible.
EDRS price: MF01/PC04 plus postage.
Document Type: Practicum Paper (043); Computer Programs (101)
Major Descriptors: *Computer Assisted Instruction; *Computer Networks; *Grade 6; *Instructional Design; *Local Area Networks

This practicum was developed in response to a concern that a week-long orientation program did not eliminate the difficulties experienced by sixth graders in signing onto and using the school's Local Area Network (LAN). Class printouts demonstrated a noticeable discrepancy between the number of skills students were supposed to complete and the actual number completed. To remedy this situation, a computer program was developed to introduce practicum participants to networking; to explain the signing on process in a clear concise way; and to demonstrate the proper use of the computer control keys needed to successfully use the networking software. Results showed marked improvement in the use of the LAN by practicum participants. This tutorial is now recognized as an integral part in the implementation of the school's networking program. Appendices include a pre/post test, charts of student progress made, a glossary, an annotated bibliography of 10 items, and a computer printout of the program complement.

ED325111
Telecommunications in the Classroom.
Clark, Chris; And Others
Computer Learning Foundation, Palo Alto, CA.; International Society for Technology in Education, Eugene, OR.
1989, 79p.
Available from: International Society for Technology in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403.
EDRS price: MF01 plus postage. PC not available from EDRS.
Document Type: Non-Classroom Material (055)
Major Descriptors: *Computer Assisted Instruction; *Educational Technology; *Electronic Classrooms; *Lesson Plans; *Telecommunications

This document is a resource guide for educators on using telecommunications in the classroom. The first chapter provides a brief history of telecommunications, describes what telecommunications is, and discusses its value in the classroom today. The second chapter discusses the parts of a telecommunications system and provides technical information, including the technical vocabulary needed to use telecommunications. The third section provides lesson plans for using telecommunications in the classroom. The plans were written by classroom teachers across the United States and Canada and selected as exemplary plans from entries received in the Computer Learning Month/ICCE 1988 Telecommunications Lesson Plan Contest. Each plan consists of a one-page summary of strategies for using computers and software in the classroom and includes the title, author, major objectives, grade level, materials checklist, time required, prerequisite student skills, activities and procedures, follow-up activities, and additional notes. The lesson plans include introductory lessons on telecommunications as well as language arts, mathematics/science, social studies, online research, and student dream projects. A chart is provided to

aid in locating lessons by subject area and grade level. The final chapter lists telecommunications services and resources currently available, and a glossary of terms and an index are provided. (11 references)

ED326187
Access, Quality and Economy: The Unfinished Agenda for America's Schools. (Education Technology and Higher Literacies). Finance Collaborative Working Paper #4.
Jones, J. Quentin
Education Commission of the States, Denver, Colo.; National Conference of State Legislatures, Washington, D.C.
Oct 1988, 29p. Produced by The School Finance Collaborative a Joint Effort of the Education Commission of the States and the National Conference of State Legislatures.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS price: MF01/PC02 plus postage.
Document Type: Review Literature (070); Position Paper (120); Project Description (141)
Major Descriptors: *Communications Satellites; *Computer Assisted Instruction; *Distance Education; *Educational Technology; *Telecommunications

Focusing on interactive, computer-based systems and external, long-distance instruction transmitted from one or more satellite earth stations, this paper begins by citing the need to experiment with and develop new delivery systems that will increase productivity in both teaching and learning. The use of satellite technology in Utah and Texas is discussed, as well as Washington State's program, "Satellite Telecommunications Educational Programming" (STEP). It is noted that computer-assisted instruction, computer-managed instruction, and other uses of computers in the classroom: (1) are not uniformly implemented as instructional innovations; (2) vary in effectiveness as teaching/learning tools; (3) vary in cost effectiveness; (4) are not always accessible to all groups of students; and (5) require systematic, sophisticated, and long-term inservice training of teachers, as well as a reworking of the scope and sequence of school curricula, in order to reach their potential. The relationship between educational technology and state educational agencies is discussed, particularly in terms of access to and quality of education; the extent to which the state regulates school governance; teacher certification; school accreditation; and the state-operated infrastructure that supports public education. (16 references)

ED325112
Electronic Bulletin Boards.
Landberg, Ted
National Bureau of Standards (DOC), Washington, D.C. Institute for Computer Sciences and Technology.
Apr 1986, 38p.
Report No: NBSIR-86-3356
Available from: National Technical Information Service, Springfield, VA 22161 ($9.95).
EDRS price: MF01/PC02 plus postage.
Document Type: Classroom Material (050); Project Description (141)
Major Descriptors: *Electronic Mail; *Information Networks; *Microcomputers; *Telecommunications

This manual is intended to provide guidance to those interested in establishing an electronic bulletin board system (BBS) that enables users to send and read messages both individually and by teleconferencing, and to transfer files to and from the system. The manual begins with a definition of a BBS and explains its uses and facilities. It then gives instructions for starting and operating a BBS, including: (1) hardware requirements (microcomputers, modems, telephone lines, printer and a tape backup system); (2) software requirements (bulletin board system software, call analyzer software, and multi-tasking software); and (3) the selection of a system operator. Also discussed are the day-to-day operations of a BBS, including monitoring messages, refreshing bulletins or files, taking security precautions to safeguard the system, and analyzing bulletin board traffic. The appendices include a list of the functional features of a BBS, examples of the screen displays from the Microcomputer Electronic Information Exchange (MEIE) BBS, and an explanation of XMODEM file transfer procedures. It is noted that the MEIE is in the public domain and representative of similar commercially available products. (8 references)

ED334963
Using High Technology in Education—The Northeastern Utah Telelearning Project.
Miller, George T. W., Jr.
Uintah Basin Applied Technology Center, Roosevelt, UT.
Oct 1989, 11p. Paper submitted to Northern Rocky Mountain Educational Research Association (Provo, UT, October 1989). This article is also in: *Rural Special Education Quarterly*, v9, n4, p33-36, Winter 1989.
Available from: Uintah Basin Applied Technology Center, 1100 East Lagoon 124-5, Roosevelt, UT 84066 ($1.00).
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Networks; *Distance Education; *Program Implementation; *Rural Schools; *Teleconferencing

The Northeastern Utah Telelearning Project was created in 1985 to remedy problems of meeting core curriculum requirements and providing educational equity in rural schools, and to provide cost effective educational delivery systems to school districts. It was determined that a distance educational computer network using audiographic teleconferencing would allow up to five high schools to participate in simultaneous classroom discussion. The system, which included microcomputers, computer graphics, and telecommunications technology, was used initially by three high school teachers. The stated goals of the project were: (1) the provision of additional instructional programming for secondary and adult students in high school and college course work; (2) the provision of educational equity to all rural students; (3) the expansion of higher education and college credit offerings in rural areas; and (4) the expansion of informational/educational delivery service to all citizens within the area. Three years of successful operation has resulted in quality, cost-effective education for rural students. (3 references)

ED328224
Schools and National Telecommunications Policy.
Peterson, George A.
National Geographic Society, Washington, DC.
[Oct] 1990, 6p. For a related paper, see ED 328 223.
EDRS price: MF01/PC01 plus postage.
Document Type: Position Paper (120); Project Description (141)
Major Descriptors: *Educational Quality; *Educational Technology; *Telecommunications

The National Geographic Society believes that schools are the last major institutions in the United States to adopt new information technologies because of fear of change, fear of technology, and narrowly focused public policies. The results of this failure to modernize schools has been to graduate workers who can't meet minimum job requirements and to attempt to maintain a democracy without a properly informed citizenry. New telecommunications policy must be crafted that assures equal access for all children to educational technologies. New teaching practices must emphasize interaction between students and teachers. The National Geographic Society has a tradition of harnessing technology in the service of the community and linking technology and teaching in innovative ways. Distance education networks such as the National Geographic Kids Network is one of several educational networks that facilitate the exchange of information and advance the use of technology in educational systems.

ED331493
Telecommunications: Working To Enhance Global Understanding and Peace Education.
Schrum, Lynne M.
Apr 1991, 14p. Paper presented at the Annual Conference of the American Educational Research Association (Chicago, IL, April 3-7, 1991).
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Networks; *Cultural Differences; *Global Approach; *Telecommunications

This paper describes educational activities that make use of microcomputers and information networks to link elementary and secondary students electronically using telecommunications, i.e., communication across distances using personal computers, modems, telephone lines, and computer networks. Efforts to promote global understanding and awareness are also described, with emphasis on teacher and educator cooperation in international distance education projects that focus on cultural similarities and differences as well as issues of importance such as world peace, the Gulf War, management of global water

resources, and the plight of the homeless. It is noted that students from Australia, the Soviet Union, Denmark, Germany, the Netherlands, Israel, the United States, Norway, and many other countries have engaged in dialogues via telecommunication media, and that, in most countries, the primary obstacle to participating in an international project is funding. Other obstacles cited include technical difficulties, fear of misuse, lack of understanding, and government policies controlling information. It is concluded that, although current research on the effectiveness of the projects is scarce, global interaction can enhance understanding between cultures. (9 references)

ED331497
Education Policy and Telecommunications Technologies.
Sheekey, Arthur D., Ed.
Office of Educational Research and Improvement (ED), Washington, DC.
May 1991, 92p.
EDRS price: MF01/PC04 plus postage.
Document Type: Collection (020)
Major Descriptors: *Educational Technology; *Policy Formation; *Telecommunications

Originally prepared for two conferences co-sponsored by the Office of Educational Research and Improvement in the spring of 1990, the eight papers in this collection focus on the concerns of policymakers and critical issues associated with the application of new telecommunications technologies for improving elementary and secondary education. Papers 1-5 were commissioned for the 1990 State Technology Leadership Conference, which was conducted by the Council of Chief State School Officers in Minneapolis, Minnesota: (1) "Technology and Students at Risk of School Failure" (David W. Hornbeck); (2) "Advanced Technologies Innovations and Applications for Distance Learning" (Suzanne G. Douglas and Louis Bransford); (3) "Policies for Educational Technology: A National, State, and Local Agenda" (Richard T. Hezel); (4) "Telecommunications and Restructuring: Supporting Change or Creating It" (Saul Rockman); and (5) "Using Technology To Support Professional Development for Teachers and Administrators" (Judson Hixson and Beau Fly Jones). Papers 6-8 resulted from a Workshop on Education and Telecommunications Technologies co-sponsored by the Annenberg School of Communications' Washington Program: (6) "The Mass Learnpike: Educational Telecommunications Comes to the Commonwealth" (Inabeth Miller); (7) "A Depiction of Distance Education" (Donald C. Holznagel); and (8) "Telecommunications: The Critical Resource for Achieving National Educational Goals" (Arthur D. Sheekey and Suzanne G. Douglas). A list of participants for the Annenberg/OERI workshop is included.

ED329966
Interactive Effects of Computer Network and Student Characteristics on Students' Writing and Collaborating.
Spaulding, Cheryl L.; Lake, Daniel
Apr 1991, 26p. Paper presented at the Annual Meeting of the American Educational Research Association (72nd, Chicago, IL, April 3-7, 1991).
EDRS price: MF01/PC02 plus postage.
Document Type: Conference Paper (150); Research Report (143)
Major Descriptors: *Computer Networks; *Educational Technology; *Writing Improvement; *Writing Instruction

This study investigated the effects of having student writers use a set of networked computers to assist them in their writing lessons. Subjects were 15 students who were designated by their school district as remedial writers because they did not pass a writing competency test in their freshman year. For 10 weeks students participated in the AT&T Learning Network and collaborated on a project with students in six other locations around the country and overseas connected by means of an electronic network. The project involved the writing and publication of a booklet about life in the various locations. Each student wrote an essay in September before work with the computer network system was begun and again in January after work with the computer network system was completed. Results were consistent with the findings of much larger studies. Findings indicated that the benefits of introducing network technologies in composition classrooms may be greatest for those students who have traditionally fared poorly in those classrooms. This new technology may be especially well suited to the elusive task of creating a more equitable educational system, one in which all students interact freely and comfortably with their teachers and peers, thereby increasing their opportunities to learn and grow. (Two figures and two tables of data are included and 15 references are attached.)

ED334180
Patterns of Use of an Electronic Communication Network for Student Teachers and First Year Teachers.
Thompson, Ann D.; Hamilton, Julie
1991, 12p.
EDRS price: MF01/PC01 plus postage.
Document Type: Project Description (141)
Major Descriptors: *Computer Networks; *Electronic Mail; *Information Networks; *Student Teachers

The professional isolation of educators, and particularly of new teachers, has long been a problem. A number of colleges and universities have attempted to address this problem by establishing computer networks that link experienced teachers in classrooms with beginning teachers. The College of Education at Iowa State University has established the Electronic Education Exchange, a pilot project designed to investigate the implementation of an electronic communication network for new teachers. Although getting the participants to use the system was an initial problem, specific motivation techniques facilitated the use of the system during the second half of the project. Data on use of the system suggested the following trends: student teachers communicated most frequently with other student teachers; private messages were used almost 10 times as frequently as public messages; both day and evening hours were popular times to use the system. In general, participants were positive about the experience and indicated an interest in using a similar system during their first year of teaching. Further research needs to address the specific uses of the system and the contributions of these experiences to the effectiveness of the classroom teacher. Four tables display the data; the tables are accompanied by explanations and discussion.

ED333865
Using Electronic Mail in an Educational Setting. Fastback 316.
Wishnietsky, Dan H.
Phi Delta Kappa Educational Foundation, Bloomington, Ind.
1991, 39p.
Available from: Phi Delta Kappa, P.O. Box 789, Bloomington, IN 47402-0789 ($0.90 non-members; $0.75 members).
EDRS price: MF01/PC02 plus postage.
Document Type: Non-Classroom Material (055); Project Description (141)
Major Descriptors: *Computer Networks; *Computer Uses in Education; *Electronic Mail

Part of the always-changing field of microcomputers is the growing use of electronic mail/message systems (EMMS), a general term for describing the transmission of messages using computers and telecommunications facilities. As a result of these advances, it is possible for administrators, teachers, staff, and students to have immediate access to personal messages, educational resources, information services, and each other—even when they are separated by great distances. Some varieties of EMMS include message distribution services, voice mail, document and picture transmission or fax, and computer teleconferencing. EMMS may be used to record student grades, send memos, access databases, enhance communication between faculties, allow cooperative research, enhance subject-specific student projects, and promote excellence in extracurricular activities. Some problems to be aware of in EMMS include cost effectiveness, maintenance, training, access, and supervision. In the future, however, international cooperative networks may be used to share educational information, and develop multicultural curricula. A list of EMMS resources includes eight journals, five associations, four online sources, and three resource centers.

Computer Simulation

ED328532
A Self-administered Simulation for Training Basic Classroom Skills. Final Report for Minigrant.
Strang, Harold R.
University of Virginia, Charlottesville. School of Education.
Jul 1990, 15p.
Sponsoring Agency: James Madison University, Harrisonburg, VA.
EDRS Price - MF01/PC01 plus postage.
Document Type: Project Description (141)

Major Descriptors: *Computer Assisted Instruction; *Computer Simulation; *Microteaching; *Program Effectiveness; *Teaching Methods; *Teaching Skills

This report focuses on the field testing of a recently developed self- administered microcomputer-based teaching simulation. Training-partner teacher educators from four Virginia institutions used the self-administered teaching simulation at their home sites. The educators used the simulation in a variety of ways: (1) to help education students practice classroom management skills; (2) to establish a network allowing up to 20 participants at one time to engage in the simulated teaching activity; (3) as a course requirement or project option for several teacher preparation classes; and (4) as an in-class demonstration and/or remedial tool. The evaluations by these teacher-training partners on the effectiveness of the computer simulation are presented. The simulation strengths and weaknesses are listed as well as suggestions for improvement.

Counseling and Guidance

ED326688
Career Information Delivery Systems Inventory.
Olson, Gerald T.; Whitman, Patricia D.
Los Angeles County Office of Education, Downey, CA.
Jan 1990, 37p.
Sponsoring Agency: California Occupational Information Coordinating Committee, Sacramento.
EDRS price: MF01/PC02 plus postage.
Document Type: Non-Classroom Material (055); Test, Questionnaire (160)
Major Descriptors: *Career Information Systems; *Computer Oriented Programs; *Computer Software; *Information Sources; *Occupational Information

This inventory highlights similarities and differences between 19 computerized career information delivery systems (CIDS) so practitioners may make more informed choices concerning the adoption of such systems, and policymakers may monitor the developing scope of system features and costs. It was developed through a survey of computer products vendors developed by California educators and media consultants. The CIDS included in the inventory are the following: Guidance Information System (GIS); DISCOVER (for High Schools, Junior High and Middle Schools, Colleges, and Adults; SIGI PLUS; CHOICES; CHOICES for Adults in Career Transitions; CHOICES Jr. for Junior High and Middle Schools; EUREKA; California VIEW; VAL SEARCH; Placement Problem Solver; DATAMASTER; OASYS; COSS; RAVE (Realistic Assessment of Vocational Experience); Peterson's; ISABEL; and DISCOVER for Mini-Computers. For each system, information is provided in chart format concerning computer hardware on which the system will run, personal computer memory requirements, additional hardware features, ease of use, tests for which scores may be entered, attributes that can be assessed online, theoretical orientation, audience for whom the system's theoretical orientation is appropriate, descriptive information included in the occupational files, files of postsecondary programs, basis for occupational files and updates, cost, additional cost factors, and system reading level. The survey instrument, and a glossary of terms are included.

Courseware and Software

ED329239
Problem Solving Software: What Does It Teach?
Duffield, Judith A.
Apr 1990, 27p. Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16, 1990).
EDRS price: MF01/PC02 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Problem Solving; *Thinking Skills; *Transfer of Training

The purpose of this study was to examine the potential of computer-assisted instruction (CAI) for teaching problem solving skills. It was conducted in three phases. During the first phase, two pieces of problem solving software, "The King's Rule" and "Safari Search," were identified and analyzed. During the second phase, two groups of six fourth-grade students were each observed using one piece of software

for seven 30-minute sessions. Think-aloud protocols were collected at the beginning and end of the observational period. Posttests were administered to assess problem solving ability and transfer. In the third phase, these data were first analyzed separately by software, then the results were compared. While the students used limited versions of the strategies the software claimed to teach, students were also found to have developed several strategies that allowed them to succeed in the program without using the desired strategies. No transfer of the problem solving strategies was observed. This type of research will provide valuable clues for the design of effective problem solving software. (21 references)

ED325092
Advisory List of Computer Courseware, August-September 1990.
North Carolina State Department of Public Instruction, Raleigh. Division of Media Evaluation Service.
1990, 28p. For April to July 1990, see ED 320 568.
EDRS price: MF01/PC02 plus postage.
Document Type: Serial (022); Book-Product Review (072); Bibliography (131)
Major Descriptors: *Communication Skills; *Computer Assisted Instruction; *Courseware; *Reading Instruction

Two issues of this listing (August and September 1990) contain reviews of courseware for kindergarten through grade 12. Entries are classified by subject or application: communication skills, which include instruction in reading and writing; mathematics; microcomputer programing; science; social studies; and utilities (desktop publishing software). Information on each software package includes the title, publisher, copyright date, price, package contents, equipment required, suggested grade level, and program goals. This is followed by a detailed summary, a discussion of major strengths and weaknesses, and a statement of recommended uses. The table of contents of each issue provides an annotated list of the software packages reviewed in that issue.

ED328240
Advisory List of Computer Courseware. December 1990.
North Carolina State Department of Public Instruction, Raleigh. Division of Media Evaluation Service.
Dec 1990, 15p. For other 1990 *Advisory Lists*, see ED 320 533, ED 320 568, ED 325 092, and ED 328 841.
EDRS price: MF01/PC01 plus postage.
Document Type: Book-Product Review (072); Bibliography (131)
Major Descriptors: *Computer Assisted Instruction; *Courseware; *Mathematics Instruction

The December 1990 Media Evaluation Services list of computer courseware includes the following: (1) Group Grammar: grades 5-10 identify elements of grammar and mechanics; (2) Ready-Set-Read: Sequence: grades K-2 put pictures or sentences in order; (3) Write-On Sarah, Plain and Tall: grades 4-7 develop reading, writing, and thinking skills through literature-based instruction; (4) Common Arithmetic: grades 4-6 practice computation and thinking skills through games; (5) MECC Estimation Series: Estimation Quick Solve I: grades 5-8 practice estimation in a game show format; (6) What Shape Is That Color? grades 3-12 develop problem-solving and mathematical reasoning skills; (7) Your Personal Trainer for the SAT: grades 9-12 prepare for the Scholastic Aptitude Test; (8) Dinosaur Blend: grades 3-8 receive integrated mathematics learning through a multifaceted package; and (9) Science Inquiry Collection: Fossil Hunter: grades 4-6 apply organizational and analytical skills while exploring fossils. Each item is described fully with price and required equipment included. Strengths and weaknesses of each are also listed together with suggestions for classroom use.

ED332692
Computer Courseware. Advisory List.
North Carolina State Department of Public Instruction, Raleigh. Division of Media Evaluation Service.
Apr 1991, 10p.
EDRS price: MF01/PC01 plus postage.
Document Type: Bibliography (131)
Major Descriptors: *Communication Skills; *Computer Assisted Instruction; *Courseware

Computer courseware appropriate for instruction in grades K-12 is listed in this document. Entries are classified by subject or application: (1) communication skills, which include instruction in reading, writing, and research sources; (2) mathematics; (3) college selection services; (4) problem solving; and (5) social studies. Information on each software package includes the title, publisher, copyright date, price, package contents, equipment required, suggested grade level, and program goals. This information is followed by a detailed summary, a discussion of the courseware's major strengths and weaknesses, and a

statement of recommended uses. The table of contents provides an annotated list of the software packages reviewed in this issue.

E328241
Index to Courseware on Advisory Lists: January 1986-November 1990.
North Carolina State Department of Public Instruction, Raleigh. Division of Media Evaluation Service.
Oct 1990, 25p. For 1990 *Advisory Lists*, see ED 320 533, ED 320 568, and ED 328 240.
EDRS price: MF01/PC01 plus postage.
Document Type: Bibliography (131)
Major Descriptors: *Communication Skills; *Computer Assisted Instruction; *Computer Software Reviews; *Courseware; *Mathematics Instruction

This document contains a list of microcomputer courseware titles which appeared on the Advisory Lists of Computer Courseware between January 1986 and November 1990. Courseware is first presented alphabetically by title with producer, grade level, and reference for the full citation included. Courseware is then presented by the following subject areas: (1) Arts Education (8 titles); (2) Computer Literacy (10 titles); (3) Communication Skills (125 titles); (4) Guidance (5 titles); (5) Healthful Living (9 titles); (6) Mathematics (120 titles); (7) Media (22 titles); (8) Management (5 titles); (9) Multiple Subject Areas (9 titles); (10) Problem Solving (13 titles); (11) Programming (2 titles); (12) SAT Preparation (9 titles); (13) Science (83 titles); (14) Social Studies (70 titles); (15) Utility (34 titles); (16) Vocational Education (12 titles); and (17) Word Processing (1 title). Again, each listing includes producer, grade level, and reference for the full citation.

ED328229
New and Promising: Software Worth a Look. A MicroSIFT Survey of Educational Software Preview Center Coordinators. Volume II, No. 2.
Podany, Zita
Northwest Regional Educational Laboratory, Portland, Oreg.
Nov 1990, 11p. For Volume II, No. 1 of this series, see ED 320 570.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS price: MF01/PC01 plus postage.
Document Type: Directory (132)
Major Descriptors: *Computer Assisted Instruction; *Courseware

This guide lists 19 software packages considered to be worthy of further consideration by other reviewing agencies and schools by a group of 17 computer coordinators from educational software preview centers and evaluation agencies. The following software is listed: (1) ASK-IT, an authoring tool; (2) Balance of the Planet, an environmental simulation game; (3) Combo Pack Graphics, 300 graphics pertaining to nature, holidays, history, world cultures, and community among others; (4) Decision, Decisions: The Environment, a simulation dealing with environmental issues; (5) Discis Books, language arts books enhanced with music, voice, and sound effects; (6) File Force, a database manager; (7) FileMaker Pro, a database manager; (8) French Assistant, Version 4, a collection of translation, reference, and writing tools; (9) Igor Stravinsky, The Rite of Spring, analysis of Stravinsky's ballet score; (10) MacGraphX, a charting and graphics tool; (11) MathLab (Series I, II, III), for whole numbers, fractions and decimals, and special topics; (12) McGee Visits Katie's Farm, a preschool program for becoming familiar with computers; (13) Physics Explorer Series; (14) Probability Lab, explores statistical concepts; (15) SimEarth, a science simulation; (16) Spanish Assistant, Version 4, a collection of translation, reference, and writing tools; (17) Special Writer Coach, for writing skills; (18) Talking Sticky Bear Series, explores shapes, the alphabet, and opposites; and (19) ToolBook 1.0, for creating and customizing graphic applications. Each listing contains a brief description, the price, hardware requirements, and grade level. Producer contact information is provided at the conclusion of the guide.

ED323948
Interplay of Interactivity and Motivation in Educational Software.
Schwartz, Daniel L.; Buckley, Jeanne
Feb 1990, 9p. In: *Proceedings of Selected Paper Presentations at the Convention of the Association for Educational Communications and Technology*; see ED 334 969.
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Software; *Design Preferences; *Interaction; *Student Motivation

This study tested the hypothesis that children bring specifiable expectations to their use of interactive computer programs, and that these expectations will determine, to a large extent, which features of a given program will be motivating to a child. It is also argued that the different genres of interactivity relied upon by software designers will elicit different expectations from a child. Subjects were 14 fifth-grade students. Three sets of data were collected by: (1) asking students to sort software titles into piles of "like" programs; (2) asking students to indicate on a scale of one to three how much they like to use each program; and (3) identifying the interactive elements of the favored software genre-adventures through group interviews. The groupings were recorded and children were asked to label each pile. The analysis yielded seven clusters of programs that could be differentiated according to the students' labels, and four ways of interacting in and with the world were identified. To investigate the relationship of motivation to interactive formats, the motivational strength of a program was measured by asking 22 subjects to complete a questionnaire by indicating how often they would choose to use each of the programs in their free time. Adventures and programs which generated printer output were significantly preferred to the other clusters but not to one another. It is suggested that what makes each program so successful is the fit between the reasons the child wants to use the program and the interactive environment it creates, and the similarity between the motivating goal structure for that type of activity in the real world and in the software program. (9 references)

Ethics

ED325780
Legal, Professional and Ethical Issues: The Use of Computers.
Drier, Harry N.
National Consortium of State Career Guidance Supervisors, Columbus, OH.
Nov 1990, 20p.
EDRS price: MF01/PC01 plus postage.
Document Type: Position Paper (120)
Major Descriptors: *Computer Uses in Education; *Counseling; *Ethics

This monograph deals with normative ethics, or the application of ethical principles in judging the rightness or wrongness of actions. Specifically, the monograph addresses normative ethics in the use of automated systems in the field and practice of counseling and guidance. It is noted that the immense growth planned for computer applications in guidance and counseling suggests the potential value in looking at ethics from the perspective of philosophical analysis, or metaethics. These legal issues in the use of computers in counseling are discussed: confidentiality; reliability; records; research; security; and networks. These ethical issues are discussed: screening of clients; literacy; testing and interpretation; popular misconceptions; counselor intervention; system access; unattended access to software; software bias; freedom of choice; climate of integrity; confidentiality within and among groups; notes and records of client sessions; orientation to expectations and limitations; and experimentation and research. These professional issues are discussed: learning styles; decisionmaking and planning; graduation requirements, tracking, and determination; professional renewal; systems evaluation; purchase guidelines; video enhancements; informed consumerism; conflict with counselor advice; and individual and computer scoring. The monograph concludes with the recommendation that new ways must be found to take advantage of technology in order for counselors to have more supportive, insightful, private time with clients.

ED324821
Educational Computing: Ethical Issues for School Administrators and Policy Makers.
Hunt, Nancy P.; Papalewis, Rosemary
Nov 1989, 11p. Paper presented at the Annual Meeting of the California Educational Research Association (San Francisco, CA, November 1989). Small, broken print in the attachment may not reproduce in paper copy adequately.
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Administrator Responsibility; *Computer Software; *Ethics; *School Policy

The amount of knowledge that site and central office administrators possess about the ethical use of computer software in schools is assessed in this report. Specific questions addressed included the existence of related policies, administrators' knowledge of policies, and degree of site compliance. Four dis-

trict and 10 site administrators were surveyed. A conclusion was that most districts lacked board policies or regulations governing the use and copying of software, and that central office administrators were unaware of their existence. A second finding was that districts with policies often did not comply with them. Results demonstrate the need for specific guidance in administrator education to address ethical issues in computing. An appendix contains two International Council for Computers in Education policy statements regarding the ethical use of computers by educators and software copyright policy and guidelines. (6 references)

Interactive Video

ED326208
An Analysis of Evaluations of Interactive Video.
Bosco, James
Mar 1990, 16p. Paper presented at the International Conference on Computers and Education (5th, Brussels, Belgium, March 20-22, 1990).
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Academic Achievement; *Computer Software Evaluation; *Evaluation Criteria; *Interactive Video; *Research Methodology; *Student Attitudes

This review of evaluations of interactive video completed from 1985 to 1989 includes only those evaluations that pertain to the instructional use of interactive video, are included in a database, and are in the public domain. Examination of 19 evaluations reveals that many of them were conducted over brief amounts of time, and that the programs being evaluated were not adequately described. Results on attitude were generally positive, whereas results on achievement were mixed. It is easier to achieve positive data on attitude since many individuals are impressed by the mechanism and characteristics of interactive video equipment. Mixed results on achievement can be attributed to the many possible variations in the wide range of design characteristics for interactive video which render any kind of general statement about achievement invalid. Formative evaluation continues to be an important need in the design of interactive video. Finally, interactive video allows an individual to select and sequence instruction in a way that is meaningful to him or her. Such learning is usually non-sequential and non-linear, and requires a fundamental change in approach to designing instruction. Information on the 19 individual reviews is summarized in tabular format.

ED324840
An Interactive Videodisc Program To Evaluate and Train Job-Related Math Skills for Transition. Final Report.
Harris, Carolyn DeMeyer; And Others
Macro Systems, Inc., Silver Spring, Md.
30 Nov 1989, 663p.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS price: MF03/PC27 plus postage.
Document Type: Project Description (141)
Major Descriptors: *Interactive Video; *Job Skills; *Material Development; *Mathematics Skills; *Mild Mental Retardation; *Simulation

The project designed and developed a videodisc package that provides both assessment and related instruction programs for job-related mathematics problem solving, using simulations to provide direct access to vocational situations. The materials are intended to meet the needs of youth and young adults with mild mental handicaps in transition from school to work. The project analyzed current student performance competencies related to the use of mathematics in both generic and specific vocational situations, designed and developed interactive videodisc materials called "Working with Math," and conducted a pilot test. Students were instructed, and student performance was assessed, in the following areas: measuring length, perimeter, area, capacity, weight, temperature, and time; money values and relationships; money earned; and money-related forms. The report's five sections consist of an introduction, descriptions of the design and development, pilot test and dissemination activities, and a list of 11 references. Appendices, which make up the bulk of the document, include: (1) a list of basic and job-related mathematics skills; (2) the scripts used in the assessment portion of the videodisc program; (3) the scripts used in the instruction portion of the videodisc program; and (4) a pilot test rating sheet.

ED325075
Interactive Optical Technologies in Education and Training Markets.
Helsel, Sandra
Feb 1990, 10p. Paper presented at the Society for Applied Learning Technology (Orlando, FL, February 1990).
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Allied Health Occupations Education; *Courseware; *Industrial Training; *Interactive Video; *Management Development; *Multimedia Instruction

Four major education and training markets for multimedia products are: (1) industrial training; (2) management and professional education; (3) medicine and the health sciences; and (4) formal education, including public, higher and adult education. The industrial training market refers to the development of nonmanagerial, technical, and non-technical skills in industry, and focuses on specific applications. Interactive optical technologies have not yet been widely used for training purposes by U.S. businesses because of the incompatibility between hardware systems and the lack of courseware. Courseware development, however, has grown in the managerial and professional marketplace where problem solving and other thinking skills must be taught. International Business Machines' (IBM) InfoWindow has become the standard for videodisc training. The health sciences provide a further market for videodisc programs, and for IBM programs in particular. IBM provides support to the Healthcare Interactive Videodisc Consortium, a group of medical and nursing schools that are developing interactive videodisc instruction for healthcare training. Macintosh computers and Hypercard programs are also becoming popular in the medical education field. Although Hypercard use has grown in the field of formal education over the last decade, education's traditional reluctance to accept new materials or methodologies has hampered the growth of the public education and higher education marketplaces for optical media. Patterns for the development of courseware include vendor-developed and in-house development in all four marketplaces. (5 references)

ED329214
Implications of Interactive Video for Education and Annotated Bibliography.
Page, Marilyn
1990, 56p.
EDRS price: MF01/PC03 plus postage.
Document Type: Review Literature (070); Bibliography (131)
Major Descriptors: *Courseware; *Interactive Video

This paper describes interactive video and the advantages and disadvantages to using interactive video in education and training. Examples of classroom use of interactive video are discussed in terms of its benefits as an educational strategy and the drawbacks of teacher preparation. It is noted that there are currently three levels of interactive video use: (1) a monitor and videodisc player with interaction accomplished manually by manipulating the videodisc player; (2) a videodisc player with a built-in microprocessor which executes precoded programs on the disc; and (3) a videodisc player interfaced with a computer and controlled by a program authored by the user. Other advantages of interactive video discussed include use of color, motion, branching, feedback, data storage, information presentation, and slide presentation. Other disadvantages noted include cost, lack of courseware, and teacher attitudes toward their changing role in the classroom. Potential uses of interactive video in classrooms are described. The 58-item annotated bibliography makes up nearly half of the document.

Keyboarding

ED333175
Keyboarding/Typewriting & Advanced Typewriting/Wordprocessing. Course Guide.
North Carolina State Department of Public Instruction, Raleigh. Division of Vocational Education.
1991, 112p.
EDRS price: MF01/PC05 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Competence; *Competency Based Education; *Keyboarding (Data Entry); *Learning Activities; *Typewriting; *Word Processing

This course guide contains 21 competency goals—keyed to competency objectives, student activities,

and suggested resources—for secondary keyboarding/typewriting and advanced typewriting/word processing courses. The 21 competency goals cover the following topics: basic equipment, keyboarding techniques, touch techniques, formatting and document preparation terminology, work habits, leadership skills, proofreading, spelling and accuracy, error correction methods, composing at the keyboard, business correspondence, business forms, tables, reports, reprographic methods, word processing software, administrative support word processing environments, production standards, office communications, word processing simulations, and employability skills. Eleven appendixes, which make up about one-fourth of the document, contain tables of grades for gross words per minute for various semesters and equipment, accuracy grades for beginning and advanced keyboarding students, and checklists for computer/printer parts and electronic typewriter parts.

Logo

ED325101
Deductive Reasoning, Logo and the Schools.
Brownell, Gregg; Zirkler, Dieter
1990, 4p. Paper presented at the International Conference on Technology and Education (7th, Brussels, Belgium, March 20-22, 1990).
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Critical Thinking; *Error Correction; *Programing; *Thinking Skills

Children often have difficulty developing debugging skills. This may be attributable to instructional methods that discourage reflection on one's reasoning errors. Logo instruction may encourage such reflection. Two studies examined Logo's effect on confirmation bias—the tendency to select confirming over disconfirming information to prove an hypothesis. One study viewed elementary students while the second investigated college students. A third study investigated confirmation bias developmentally in grades 4 through 12. While Logo programming did not significantly effect deductive reasoning, elementary students exhibited an unusually high tendency to be disconfirmers while college students were confirmers. A significant difference was found in that twelfth graders more frequently selected confirming information than did fourth graders. This suggests that elementary students may be less resistant to learning self-reflective debugging skills than older students. Also, programming instructors may need to generate specific strategies to address confirmation bias in older students at the secondary school and university levels.

ED326403
Developing Problem Solving Skills of Primary Age Children within a Logo Environment.
Martin, Patricia B.
Oct 1990, 110p. M.S. Practicum, Nova University.
EDRS price: MF01/PC05 plus postage.
Document Type: Practicum Paper (043)
Major Descriptors: *Computer Assisted Instruction; *Critical Thinking; *Elementary School Science; *Problem Solving; *Thinking Skills

This practicum addressed the importance of the development of problem solving skills in primary age children. Students need to practice recognizing the problem, deciding what steps are necessary in solving the problem, evaluating the solution, and revising the steps, when necessary. Summer camp computer students who were entering second grade practiced these skills in the EZ Logo environment while duplicating specific shapes and creating original shapes. It was determined that the Logo environment was an asset to the practice of problem solving skills. The document includes the purpose of the project, a brief literature review, a summary of the methods used, results, and recommendations. Appended are the pre/post-tests, teacher survey, results of activities, and samples of student graphics.

ED330326
Fantastic Journey through Minds and Machines.
Muir, Michael
International Society for Technology in Education, Eugene, OR.
1990, 135p.
Available from: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-1923. Includes sample programs on data diskettes in three formats (LogoWriter for MS-DOS, LogoWriter for Apple II, and Terrapin Logo PLUS for Apple II).
EDRS price: MF01 plus postage. PC not available from EDRS.
Document Type: Instructional Material (051); Non-Classroom Material (055); Computer Programs (101)
Major Descriptors: *Artificial Intelligence; *Microcomputers; *Programing

Intended for learners with a basic familiarity with the Logo programming language, this manual is designed to introduce them to artificial intelligence and enhance their programming capabilities. Nine chapters discuss the following features of Logo: (1) MAZE.MASTER, a look at robots and how sensors make machines aware of their environment; (2) SMARTTT, a discussion of games of strategy and decision making; (3) TALK.AND.DRAW, a description of languages for both humans and machines; (4) DOCTOR, a continuation of the discussion of languages that looks at conversationalists; (5) BLOCKS, a creation of a microworld in which a computer answers questions about work it has done; (6) INFER, an examination of logic, specifically, a hypothetical syllogism; (7) SUPER.INFER, a look at knowledge representations in intelligent programs; (8) SUPER.INFER2, a collection of procedures providing a natural language interface; and (9) VEXPERT, a discussion of expert systems. Each chapter contains four parts: background information, sample program, suggested extensions and improvements, and the complete program listing in LogoWriter and in Terrapin Logo PLUS. The LogoWriter MS/DOS data disk and LogoWriter Apple II data disk that accompany the manual are not included in this document. (21 references)

ED327139
Results of Four Studies on Logo Programming, Problem Solving, and Knowledge-Based Instructional Design.
Swan, Karen; Black, John B.
Mar 1990, 5p. Paper presented at the International Conference on Technology and Education (Brussels, Belgium, March 20-22, 1990).
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Problem Solving; *Thinking Skills

The results of four research studies conducted with subjects ranging in age and ability from elementary to graduate school students demonstrate that Logo programming environments can be instrumental in the development of five particular problem solving strategies: (1) subgoals formation; (2) forward chaining; (3) systematic trial and error; (4) alternative representation; and (5) analogy. In fact, computing environments may be uniquely conducive to the development of such skills, in that they can support quasi-concrete, malleable representations of abstract strategies that can help learners bridge the gap between concrete and formal understanding. Results also indicate, however, that problem solving strategies will not be developed through Logo programming alone, but rather must be explicitly taught and practiced. (11 references)

ED327137
Teachers as Collaborative Researchers: Professional Development through Assessing Logo Learning.
Watt, Molly L.; Watt, Daniel H.
Education Development Center, Inc., Newton, MA. Center for Learning Technology.
Sep 1988, 24p. Paper presented at the National Educational Computing Conference (Dallas, TX, June 15-17, 1988). Three appended figures have small, broken type.
Sponsoring Agency: National Science Foundation, Washington, D.C.
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Classroom Observation Techniques; *Professional Development; *Teacher Workshops

This paper describes a series of collaborative research seminars designed to allow classroom teachers to observe and assess critical aspects of Logo learning in their own classrooms. Based on structured interviews with participating teachers, the workshops are designed to support classroom teachers in observ-

ing their own students, collecting data about their work, and assessing their learning of Logo. Printouts of student Logo programs and a critical aspects checklist provide data for group discussion. The case study approach is used to help teachers in presenting data and research questions about a student's work. It is noted that an important outcome of the research seminars involves documenting the professional development of participating teachers. Personal experiences of one participant are included, as are samples of students' Logo work, a data template, and the critical aspects checklist. (21 references)

ED329430
Young Children Learn Geometric Concepts Using Logo with a Screen Turtle and a Floor Turtle.
Weaver, Constance L.
1991, 23p.
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143)
Major Descriptors: *Computer Assisted Instruction; *Concept Formation; *Early Childhood Education; *Geometric Concepts; *Learning Activities

This research was designed to investigate several primary questions in comparing the Logo floor turtle to the Logo screen turtle: (1) Do young children gain different geometric concepts from experiences with the floor turtle than they do with the screen turtle? (2) Do young children learn to use the four basic Logo commands more efficiently with the floor turtle than they do with the screen turtle? (3) Do young children prefer interacting with the floor turtle or the screen turtle? (4) Do the children who learn Logo gain more in perspective-taking ability than do the children who do not learn Logo? (5) Do the children who learn a single-key version of Logo in a geometry setting learn more geometry concepts than the children who did not learn Logo? This study included 17 4-year-old and 79 5-year-old children who were members of 5 classes in the suburbs of Buffalo, New York. A four (turtle, screen, paths, control) by four (four different teachers) design was used with planned contrasts for the kindergarten children. The preschool children were placed into either the floor turtle group or the screen turtle group. The initial lessons of Clements' and Battista's Logo Geometry Curriculum (1989) were used to teach Logo and elementary concepts of geometry related to path. The children in the experimental groups averaged two to three computer sessions per week for about 6 weeks. The results of the study were mixed. Significant differences in ability to use Logo were not found between groups, nor did the children show a clear-cut preference for one kind of turtle over another. The children's perspective-taking abilities did not change over the time of the study, and while geometry scores did improve, no significant differences between groups were found on the geometry tests.

ED331468
Introduction to LogoWriter and Problem Solving for Educators.
Yoder, Sharon; Moursund, David
International Society for Technology in Education, Eugene, OR.
1990, 113p.
Available from: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-9905.
EDRS price: MF01 plus postage. PC not available from EDRS.
Document Type: Non-Classroom Material (055)
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Inservice Teacher Education; *Preservice Teacher Education; *Problem Solving; *Programing

This book about Logo programming and problem solving is designed to introduce preservice and inservice teachers to problem solving in a Logo programming environment. Such a unit of study can be an important part of an introductory computers in education course for educators. Although Logowriter—a version of Logo—was developed by Logo Computer Systems, Inc., primarily for use on the Apple II, MS DOS (IBM compatible), and Commodore microcomputers, no specific computer hardware or version of Logo is required to use the ideas presented in this book. The following topics are discussed: (1) getting started with Logowriter; (2) using REPEAT and turtle move mode; (3) color and RANDOM, shapes and STAMP, FILL and SHADE; (4) mixing text and graphics; (5) writing procedures and more than one procedure; (6) designing programs; and (7) music. Appendices include a description of Logowriter keys, keyboard stickers, and a list of quick word references. (34 references)

ED322895
Introduction to Programming in Logo Using LogoWriter. Revised Edition.
Yoder, Sharon Burrowes
International Society for Technology in Education, Eugene, OR.
1990, 154p.
Report No: ISBN-0-924667-47-8
Available from: International Society for Technology in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403-9905 ($14.95 prepaid).
EDRS price: MF01 plus postage. PC not available from EDRS.
Document Type: Teaching Guide (052); Computer Programs (101); Instructional Material (051)
Major Descriptors: *Computer Graphics; *Programing; *Word Processing

This book is designed to teach LogoWriter, a programming language. Each of the 41 small chapters focuses on a particular LogoWriter word or idea, and provides examples for practice and experimentation. Topics included are: (1) getting started with LogoWriter; (2) using repeat and label; (3) using color and random, shapes and stamp, fill and shade; (3) using text, mixing text and graphics, writing procedures; (4) cut, copy, and paste; (5) working with pages, Logo grammar, Logo arithmetic, printing; and (6) text manipulation, interactive programming, and designing programs. Ten appendices include key summaries, copies of keyboard stickers, and a quick reference card.

ED330310
Introduction to Programming Using Terrapin Logo for the Macintosh.
Yoder, Sharon Burrowes
International Society for Technology in Education, Eugene, OR.
1991, 213p.
Available from: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-1923.
EDRS price: MF01 plus postage. PC not available from EDRS.
Document Type: Instructional Material (051); Teaching Guide (052)
Major Descriptors: *Programing

This manual has a dual purpose: to teach about programming in the Logo language for teachers, and to teach Logo in a structured manner to students. The publication is divided into 41 sections, each of which focuses on a particular Logo word or idea, and is designed to give both teachers and students the opportunity to experiment with ideas while extending their knowledge of Logo. Some of the subjects covered in the individual chapters include: (1) getting started with Logo for the Macintosh computer; (2) using the Repeat function; (3) shapes and STAMP; (4) defining new shapes, putting text on the screen, and mixing text and graphics; (5) writing procedures; (6) designing programs; (7) managing workspace and files; (8) using pen modes, windows, and multiple turtles; (9) Logo grammar; (10) animation, creating definite loops, stamping areas, interactive programming, and working with files; (11) procedure inputs; (12) Logo arithmetic and mathematics; (13) outputs; and (14) useful graphics and text reporters. Most of the chapters provide tips and techniques as well as project suggestions. It is suggested that the examples in each chapter be experimented with until the concept being introduced is understood. A quick reference card of all the Terrapin Logo primitives is provided at the end of the manual, and major subject areas and Logo commands are listed in the index.

Management/Administration

ED334683
Sharing the Vision, Power, and Experience: Increasing the Technology Competence of Administrators.
Beaver, J. F.
1990, 10p. Paper presented at the Annual International Conference on Technology and Education (7th, Brussels, Belgium, April 1990).
EDRS price: MF01/PC01 plus postage.
Document Type: Position Paper (120); Review Literature (070)
Major Descriptors: *Administrator Role; *Administrators; *Computer Uses in Education; *Management Development; *Professional Development

Developing long-range plans that support educational computing programs requires leaders that understand the problems and promises of instructional computing. If administrators are expected to provide the vision needed to guide program development, they must first be encouraged to increase their computer competence. A course on administrative uses of computers that provides opportunities for mastering productivity applications and for planning instructional computing program development can give administrators the necessary competence to understand the kind of training and support that teachers need to help them master the machines. The paper concludes with a brief description of a recommended course. (8 references)

ED335224

Exploratory Problem Solving with a Graphing Application: Semi-automated Analysis of Student Performance Data.

Jackson, David F.

Apr 1991, 20p. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (Lake Geneva, WI, April 7-10, 1991).

EDRS Price: MF01/PC01 plus postage.

Document Type: Project Description (141); Conference Paper (150)

Geographic Source: U.S.; Georgia

Major Descriptors: *Computer Assisted Instruction; *Learning Strategies; *Mathematics Instruction; *Problem Solving; *Secondary School Mathematics; *Student Evaluation

The ability of the microcomputer to compile voluminous and detailed measures of students' learning activities automatically has seemingly outpaced the ability of commonly-used data analysis methods to make effective utilization of this wealth of potentially useful information. This study explores the use of computer-based quantitative methods, including sequence comparison and cluster analysis, to explore the learning behavior of high school students using computer software during assigned classroom problem-solving exercises that involve data analyses through graphing. Behavioral sequence data, that is, steps used in the individual student's solution process, were recorded automatically for a very large sample of high school students, along with extensive anecdotal observations and unstructured interviews during the course of normal classroom activities. The most noteworthy result was an indication of the overall persistence and resourcefulness of the students, in that the percentage using unorthodox, yet effective, approaches to solving the graphing problems was unexpectedly high. (32 references)

ED332289

The Reflective Macintosh: A Computer-Assisted Approach to Understanding and Improving Managerial Practice. Project Report.

Kerchner, Charles; And Others

Illinois Univ., Urbana. Beckman Institute for Advanced Science and Technology.; National Center for School Leadership, Urbana, IL.

1990, 52p.

Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.

Available from: Publication Sales, National Center for School Leadership, 1208 W. Springfield, Room 208, Urbana, IL 61801 (Order No. PR-B003; $12.00).

EDRS price: MF01/PC03 plus postage.

Document Type: Research Report (143)

Major Descriptors: *Administrator Effectiveness; *Cognitive Style; *Computer Oriented Programs; *Hypermedia; *Problem Solving

The early stages of a microcomputer-based project to integrate managerial knowledge and practice are described in this report. Analysis of the problem-framing process that effective principals use to reduce complex problems into more manageable ones forms the basis of the project. Three cognitive-mapping techniques are used to understand the managerial decision-making process: questioning, organizational data, and participant descriptions. An interactive computer system of hypermedia organizational information was developed from analysis of problem-framing accounts of five business and education managers participating in a seminar. A conclusion is that the program's use of interrelated facts to cross-reference information and ideas enables school leaders to analyze hypothetical questions about the potential organizational effects of a given development. The interactive computer system and its applicability to educational leadership is described. Two figures are included. (31 references)

ED332665

Computer Applications Planning: Program Assessment Profile. A Tool for Analyzing School and District Programs and Activities.

Merrimack Education Center, Chelmsford, Mass.

[Jul 1987], 21p.

EDRS price: MF01/PC01 plus postage.

Document Type: Non-Classroom Material (055); Test, Questionnaire (160)

Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; *Educational Planning; *Program Evaluation; *Staff Development Designed to rate the degree of implementation and quality of all the major components of a computer applications program, this checklist may be used by school district staff to support a self-assessment process, or by an external consultant, to identify elements of the program that need improvement or further development. The following components are included: (1) curriculum, i.e., the existence of a written curriculum for teaching computer literacy and definitions of the elements of the computer curriculum; (2) staff development, job training and computer training; (3) hardware/software and related instructional materials; (4) staffing and organization, scheduling computer assisted instruction, and other educational planning issues; (5) implementation of the program; and (6) program planning and budgeting. It is noted that a mean score for each component on both the implementation and quality scales should be computed.

ED331487

Technology in the Curriculum: A Handbook for Integrating Computers and Related Learning Technologies Throughout the Curriculum.

Merrimack Education Center, Chelmsford, Mass. [1986], 48p.

EDRS price: MF01/PC02 plus postage.

Document Type: Non-Classroom Material (055); Test, Questionnaire (160)

Major Descriptors: *Curriculum Design; *Educational Technology; *Instructional Development; *Microcomputers

This handbook is designed for use in conjunction with staff training seminars designed to provide teachers and administrators with a framework and procedures for designing and implementing effective applications of technologies in the curriculum. The intended outcome of the seminars is the development of comprehensive programs including the identification of specific programmatic areas by subject; the identification of student and staff competencies; and the projection of staff training requirements and budgets needed to accomplish specific program components. Chapter one provides an introduction to the program. A conceptual framework which focuses on concepts and principles in educational technology applications is presented in chapter two. Chapter three describes the tasks and activities that need to be accomplished to design and develop appropriate applications of technology throughout the curriculum, taking into consideration both curriculum development and instructional development issues. Illustrations throughout the document demonstrate basic curriculum development components and delineate specific action steps in educational strategies, integration of microcomputers into the curriculum, and the development of a curriculum framework. Appended are a checklist of planning steps, a sample instructional unit plan, a scope and sequence matrix for the cognitive levels and instruction sequences involved in developing writing skills, and a checklist for integrating technology into the curriculum. (41 references)

ED332670

A Template for Preparing A Technology Applications Plan.

Merrimack Education Center, Chelmsford, Mass.

Jan 1986, 22p. For a related program assessment checklist, see ED 332 665.

EDRS price: MF01/PC01 plus postage.

Document Type: Non-Classroom Material (055); Project Description (141); Test, Questionnaire (160)

Major Descriptors: *Computer Assisted Instruction; *Educational Planning; *School Districts

This annotated model outline provides guidelines for writing a plan for using computers and related learning technologies in schools. It is consistent with the components of the Merrimack Education Center's technology applications planning process, and can be modified to accommodate additional components and special school district requirements. The planning process includes several basic tasks including forming committees, assessing needs and capabilities, and formulating program goals and objectives. It is suggested that the following areas be included in a school district's technology plan: (1) the school district, current status and objectives; (2) curriculum development; (3) computer hardware,

software, and technical support; (4) staff development; (5) program organization and implementation; (6) program budget; and (7) other considerations. A complete checklist of planning process steps and a sample table of contents from a typical plan are appended. (4 references)

ED326185
Resource Manual on the Use of Computers in Schooling.
New York State Education Department, Albany. Bureau of Technology Applications.
Mar 1989, 287p. Use of colored paper from pages II-1 through V-5 may limit reproducibility. The evaluation form mentioned on p. vii is not included with this ERIC document.
EDRS price: MF01/PC12 plus postage.
Document Type: Non-Classroom Material (055); Project Description (141)
Major Descriptors: *Computer Uses in Education; *Educational Technology; *State Programs; *Teaching Methods; *Telecommunications

This resource manual is designed to provide educators with timely information on the use of computers and related technology in schools. Section one includes a review of the new Bureau of Technology Applications' goal, functions, and major programs and activities; a description of the Model Schools Program, which has been conceptually derived from the paper "Effective Schooling, Reasoning, and Computer Technology"; and a series of perspectives and initiatives on the use of computers and technology written by staff from both the Office of Elementary and Secondary Education and the Office of School Improvement and Support. A department contact person is named for each department perspective. Section two is a compendium of descriptions of promising technology programs and practices in New York State schools. These descriptions also name contact persons. Section three includes a description of distance learning and profiles of distance learning planning and implementation projects that were funded in 1986-87 and 1987-88 under the Technology Network Ties (TNT)/Distance Learning Grant Program. Section four contains descriptions of National Diffusion Network (NDN) programs which use technology for instructional purposes. Section five is a glossary of words used frequently in these papers and project descriptions.

ED326202
Opportunities for Research on the Organizational Impact of School Computers. Technical Report No. 7.
Newman, Denis
Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Center for Technology in Education, New York, NY.
Sep 1990, 12p.
EDRS price: MF01/PC01 plus postage.
Document Type: Review Literature (070)
Major Descriptors: *Formative Evaluation; *Microcomputers; *Organizational Effectiveness; *Research Methodology

As computers are acquired in greater numbers in schools, their impact on the social organization of instruction increasingly becomes an issue for research. Developments in the cognitive science of instruction, drawing on sociohistorical theory, provide researchers with an appropriate theoretical approach to cultural tools and cognitive change, while developments in the technology of computer-supported cooperative work provide researchers with models for organizational impact outside of education. The concept of a formative experiment in which schools are supported in the appropriation of new technology is illustrated by a project that implements local area network technology in an elementary school. The concept of appropriation derived from sociohistorical theory highlights how schools can make use of technology for goals not anticipated by the researcher. (42 references)

ED327172
Teaching in High-Tech Environments: Classroom Management Revisited.
Sandholtz, Judy Haymore; And Others
1990, 40p. Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16-20, 1990).
EDRS price: MF01/PC02 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Classroom Environment; *Classroom Techniques; *Computer Assisted Instruction; *Educational Change; *Microcomputers; *Teacher Role

Based on weekly reports sent via electronic mail, correspondence between sites, and bi-monthly audiotapes from teachers, this qualitative study analyses data from 32 elementary and secondary Apple Classrooms of Tomorrow (ACOT) teachers in five schools concerning management changes that occurred in teaching and learning in the new computerized classroom environment. The study covers the period from October 1985 through June 1989. Section one of the paper describes the survival stage of development in the ACOT teacher's management style, when teachers are overwhelmed by the necessity of controlling student behavior, organizing the physical environment, adjusting to the technical aspects of the instructional innovations, and redefining their role in the classroom. Mastery is discussed next. Occurring during the second year of the ACOT program, teachers begin to anticipate problems in student behavior, classroom environment, and technology, and develop strategies for solving them. The final stage, impact, occurs when teachers successfully utilize the technology for managing the classroom and focus on their effectiveness as teachers. It is concluded that teachers learned to use the technology to enhance student motivation, interest, and learning, and incorporated technology in their teaching in such a way that they now could not imagine teaching without it. (15 references)

ED327977
Beyond Computer Planning: Managing Educational Computer Innovations.
Washington, Wenifort
Oct 1990, 29p. Paper presented at the Annual Meeting of the Mid-Western Educational Research Association (Chicago, IL, October 17-20, 1990).
EDRS price: MF01/PC02 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Computer Oriented Programs; *Computer Software Evaluation; *Educational Technology

The vast underutilization of technology in educational environments suggests the need for more research to develop models to successfully adopt and diffuse computer systems in schools. Of 980 surveys mailed to various Ohio public schools, 529 were completed and returned to help determine current attitudes and perceptions of teachers and administrators toward technology practices in planning (adoption), implementation (diffusion), and evaluation (outcome). The surveys rated the importance of computer orientation, research, communications, community involvement, support, training, followup training, evaluations, outcome, and use. Results illustrate the importance of utilizing technology to improve instruction and administrative productivity, but suggest the fate of technology in schools will depend on its efficiency and effectiveness as perceived by teachers and administrators. Detailed descriptions of methodology, results, and summaries of models commonly applied to educational change are included.

ED335021
Instructor's Plan: A Lesson Planning Expert System for School Teachers.
Wilkins, Dennis A.; And Others
1990, 4p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology;* see ED 334 969.
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Authoring Aids (Programing); *Computer System Design; *Expert Systems; *Instructional Design; *Teacher Developed Materials

The product of several years of research and development at Brigham Young University, Instructor's Plan (IP) is an expert system for rapid lesson design and authoring. Its primary audience is preservice and inservice school teachers. It will run on IBM PC, XT, AT, and PS/2 systems and compatibles with a color monitor and at least one floppy disk drive. IP's central feature is its expert system, which possesses two primary components: a knowledge base and an inference engine. Founded on instructional theory that proposes that specific learning conditions require different instructional strategies or strategy modifications in order to optimize learning, the knowledge base contains both production rules and instructional strategies. The instructor can access directly and make modifications to the instructional strategy aspect. The inference engine manages the knowledge base and the inferencing process, governing the questions posed to the instructor and the searching of rules, and testing the goals of the expert system to see if they have been accomplished. IP considers two main categories of learning conditions when determining the best instructional strategy—learning outcome and instructional mode—and identifies eight learning outcomes: response, recitation, explanation, classification, prediction, decision, performance, and problem solving. The instructional mode refers to whether the lesson is more instructor or

learner centered and controlled. Formative evaluation has shown that instructors find IP very easy to learn to use and they report that it reduces planning time and improves the quality of their lesson design. (11 references)

ED325271
Computer Use by Rural Principals.
Witten, D. W.; And Others
Apr 1990, 26p. Paper presented at the Annual Meeting of the Southern Rural Education Association (5th, Atlanta, GA, April 18-20, 1990).
EDRS price: MF01/PC02 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Uses in Education; *Principals; *Rural Schools; *School Administration; *Secondary Schools

Very little research is available nationwide that measures the administrative use of computers in rural schools. A state survey of 154 rural Kentucky secondary school principals (representing a 51% response rate) focused on their knowledge about computers and use of computers for school administrative purposes. Only 14% of respondents had a computer at home, and only 21% had had special computer training. For administrative tasks related to students, computers were used by 72% for state standardized testing; by 51-63% for records, attendance, scheduling, and grade reporting; and by 27% for career planning. For administrative tasks related to staff, computers were used by 18-27% for records, evaluation reports, assignment, and leave. Only 15% of respondents were very committed to administrative computer use, while 56% were somewhat committed. This report contains recommendations to the Kentucky Department of Education concerning mandatory computer training for principals, guidelines and funding for the purchase of computer hardware and software, and networking among administrative computer users. A literature review discusses the ideal school administrative computer system, barriers to computer acceptance in rural schools, and factors to consider in hardware and software selection.

Proceedings

ED325091
Creativity through Analogy. Proceedings of the ADCIS International Conference (31st, Washington, D.C., November 13-16, 1989).
Association for the Development of Computer-based Instructional Systems.
1989, 513p. For the Proceedings of the 1987 conference, see ED 294 567.
EDRS price: MF02/PC21 plus postage.
Document Type: Conference Proceedings (021)
Major Descriptors: *Computer Assisted Instruction; *Educational Innovation; *Educational Technology; *Hypermedia; *Media Research; *Microcomputers

The theme of the 31st Conference of the International Association for the Development of Computer-Based Instructional Systems (ADCIS) was "Creativity through Analogy." This collection of conference presentations contains 66 papers and 131 abstracts for which there are no formal papers. The papers and abstracts are presented in two separate sections, but both are categorized by special interest group: (1) Academic Computing (SIGAC, 1 paper, 9 abstracts); (2) Computer-Based Training (CBT, 4 papers, 17 abstracts); (3) Elementary, Secondary, Junior College Educators (ELSECJC, 3 papers, 12 abstracts); (4) Emerging Technologies (ETSIG, 10 papers, 13 abstracts); (5) Educators of the Handicapped (SIGHAN, 1 paper); (6) Health Education (HESIG, 5 papers, 4 abstracts); (7) Home Economics Consortium (HOMEC, 5 papers, 7 abstracts); (8) Management Issues (MISIG, 3 papers, 3 abstracts); (9) PILOT Users Group (PILOT, 8 abstracts); (10) PLATO Users Group (PUG, 2 papers, 4 abstracts); (11) Interactive Video-Audio (SIGIVA, 7 papers, 26 abstracts); (12) Theory and Research (SIGTAR, 24 papers, 25 abstracts); and (13) Telecommunications (TELESIG, 1 paper, 3 abstracts). Many of the papers include abstracts and/or references, and an author index covering both sections is provided.

ED328231

Restructuring Training and Education through Technology. Proceedings of the Annual Conference of the Association for the Development of Computer-Based Instructional Systems (32nd, San Diego, California, October 29-November 1, 1990).

Dalton, David W., Ed.

Association for the Development of Computer-based Instructional Systems.

1990, 447p. For the Proceedings of the 1989 conference, see ED 325 091.

EDRS price: MF01/PC18 plus postage.

Document Type: Conference Proceedings (021)

Major Descriptors: *Computer Assisted Instruction; *Educational Innovation; *Educational Technology; *Hypermedia; *Media Research; *Microcomputers

The theme of the 32nd International Association for the Development of Computer-Based Instructional Systems (ADCIS) Conference was "Restructuring Training and Education through Technology." This collection of conference presentations contains 52 papers and 183 abstracts for which there are no formal papers. The papers and abstracts are presented in two separate sections, but both are categorized by special interest group: (1) Academic Computing (SIGAC, 1 paper, 11 abstracts); (2) Computer-Based Training (CBT, 3 papers, 27 abstracts); (3) Elementary, Secondary, Junior College Educators (ELSECJC, 3 papers, 17 abstracts); (4) Emerging Technologies (SIGET, 5 papers, 10 abstracts); (5) Educators of the Handicapped (SIGHAN, 2 abstracts); (6) Health Education (SIGHEALTH, 2 papers, 9 abstracts); (7) Home Economics Consortium (HOMEC, 3 papers, 5 abstracts); (8) Hypermedia (SIGHYPER, 5 papers, 18 abstracts); (9) Interactive Video-Audio (SIGIVA, 7 papers, 19 abstracts); (10) Management Issues (SIGMI, 1 paper, 9 abstracts); (11) Music Education (SIGMUSIC, 1 paper, 4 abstracts); (12) PILOT Users Group (PILOT, 1 paper, 3 abstracts); (13) PLATO Users' Group (PUG, 4 abstracts); (14) Theory and Research (SIGTAR, 15 papers, 38 abstracts); and (15) Telecommunications (SIGTELE, 5 papers, 7 abstracts). Many of the papers include abstracts and or references.

ED329231

National Educational Computing Conference Proceedings (11th, Nashville, Tennessee, June 25-27, 1990).

Ellis, Edwin, Ed.

Jun 1990, 358p. For the *NECC '89 Proceedings*, see ED 317 190.

Sponsoring Agency: National Educational Computing Conference.

Available from: International Society for Technology in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403-9905.

EDRS price: MF01 plus postage. PC not available from EDRS.

Document Type: Conference Proceedings (021)

Major Descriptors: *Computer Assisted Instruction; *Program Descriptions

This volume of proceedings of the 1990 National Educational Computing Conference (NECC) provides a record of the state-of-the-art in the use of computing in a variety of educational settings. Special sessions, panels, projects, 153 abstracts, and 44 papers are reported here on subjects including: elementary and secondary educational software, higher education applications, multimedia programs, hypermedia, ethics, computer education administration, interactive video, computer-assisted instruction, engineering, Logo, thinking skills, teacher education, video-based instruction, and networks. Tables and diagrams accompany some of the entries, and each of the papers contains its own list of references. An index of authors and other participants is also included.

ED334969

Proceedings of Selected Research Paper Presentations at the Convention of the Association for Educational Communications and Technology and Sponsored by the Research and Theory Division (Orlando, Florida, February 13-17, 1991).

Simonson, Michael R., Ed.; Hargrave, Connie, Ed.

Iowa State University of Science and Technology, Ames. College of Education.

1991, 1,025p. For the individual papers, see ED 334 970-335 026 and ED 323 937. For the proceedings of the 1990 conference, see ED 323 912.

EDRS price: MF07/PC41 plus postage.

Document Type: Conference Proceedings (021); Research Report (143)

Major Descriptors: *Computer Assisted Instruction; *Instructional Design; *Instructional Effectiveness; *Learner Controlled Instruction; *Research Methodology

This volume contains 57 papers and 1 symposium, consisting of an introduction and 4 papers. The topics discussed range from the instructional effectiveness of various presentation formats and media to the social foundations of educational computing and school restructuring. Cognitive theory and several design theories are also addressed. Research related to computer assisted instruction includes investigations of cooperative learning, variations in instructional control, interactive video, use of computer animation, hypermedia browsers, software for teachers to use in lesson planning, computer assisted testing, and automated instructional systems development. Formats for microcomputer displays and electronic publishing are also considered, as well as computer simulations and telecommunications-based distance education. Also included in this volume are information on the Association for Educational Communications and Technology (AECT), author and descriptor indexes, and a list of the 12 proceedings already in the ERIC system together with their ED numbers.

Research

ED334972

Effects of Variations in Learner Control on Children's Curiosity and Learning from Interactive Video.

Arnone, Marilyn Plavocos; Grabowski, Barbara L.

1991, 24p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology;* see ED 334 969.

EDRS price: MF01/PC01 plus postage.

Document Type: Research Report (143); Conference Paper (150)

Major Descriptors: *Academic Achievement; *Curiosity; *Interactive Video; *Intermode Differences; *Learner Controlled Instruction

With the emergence of interactive learning technologies, there are many questions which must be addressed concerning young learners. Such sophisticated technology combined with thoughtful instructional design has the potential for both encouraging achievement and stimulating important scholarly attributes such as curiosity and other aspects of motivation. The purpose of this study was to evaluate the effectiveness of variations in learner control (also referred to as lesson control) on children's level of curiosity and learning from computer-based interactive video (CBIV). The lesson content was art education and contained both facts and concepts. It was presented as a videodisc visit to the Everson Museum in Syracuse, New York. A posttest only control group design was employed with 103 first and second grade subjects who were randomly assigned to one of three experimental conditions (designer control, learner control, or learner control with advisement) or a control group. The independent variable for this study was the degree of lesson control which the subjects had over the content. The dependent variables were the posttest scores in achievement and curiosity. Results indicated that children in the learner-control with advisement group scored significantly better in the achievement posttest than did the learner control subjects. They also tended to score higher on certain of the curiosity subscales. (7 tables, 32 references)

ED326031

What the Research Says about Computer-Based Instruction for America's Culturally and Linguistically Diverse Students.

Haile, Penelope J.

Mar 1990, 22p. Paper presented at the Annual Conference of the Joint Center for Communication, Learning and Technology (2nd, New Orleans, LA, March 1990).

EDRS price: MF01/PC01 plus postage.

Document Type: Review Literature (070); Conference Paper (150)

Major Descriptors: *Computer Assisted Instruction; *Cultural Differences; *Instructional Effectiveness; *Language Handicaps; *Teacher Role

This review of the literature on computer-based instruction for culturally and linguistically diverse students focuses on: (1) effectiveness of computer-assisted instruction; (2) its use in enhancement of traditional education; (3) its use as an expansion tool for critical thinking; and (4) the role of the teacher. The review concludes that the computer can be effectively used for instruction in a wide variety of ways, ranging from drill and practice for mastery of basic skills to interactive, multimedia simulations for exploring sophisticated concepts. Three suggestions are made on how to gain the maximum advantage from the computer's potential: teachers need to assume more direct responsibility for developing im-

plementation strategies sensitive to the particulars of their classroom cultures; research regarding the implementation of computer-based education needs to move ahead rapidly; and software developers must use state-of-the art theories to create computer-based instructional programs sensitive to the wide range of needs and abilities of America's students. (38 references)

ED334985
CBI: Systems or Medium?
Higginbotham-Wheat, Nancy L.
1991, 14p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology*; see ED 334 969.
EDRS price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Review Literature (070); Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Delivery Systems; *Educational Media; *Evaluation Criteria; *Instructional Systems; *Media Research

This paper addresses one area of conflict in decision making in computer-based instruction (CBI) research: the relationship between the researcher's definition of CBI either as a medium or as an integrated system and the design of meaningful research questions. (A medium is defined here as a device for the delivery of instruction, while an integrated system incorporates the medium, the learner, the designer, all of the experimental variables, the hardware, the learning environment, and the software, all working together toward the intended outcome of learning.) Through a review of the literature, this paper not only explores the differing definitions of CBI as either a system or a medium, but provides examples of CBI utilized as each. Implications for researchers based on the definition of CBI as a system or a medium are discussed, and guidelines for evaluating current research in the field are provided. (31 references)

ED326203
Teachers' Beliefs and Technology Integration: Different Values, Different Understandings. Technical Report No. 6.
Honey, Margaret; Moeller, Babette
Center for Technology in Education, New York, NY.
Aug 1990, 16p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143)
Major Descriptors: *Adoption (Ideas); *Interviews; *Media Adaptation; *Microcomputers; *Program Implementation; *Teacher Attitudes

This study was designed to examine how teachers' beliefs and values influence the successful integration of microcomputers into the curriculum. Semi-structured interviews with 20 teachers were conducted in elementary, middle, and high schools in one urban and one suburban district in New York State and responses were categorized into four groups: (1) Progressive Practice and Successful Technology Integration; (2) Progressive Practice and Technological Ambivalence; (3) Traditional Practice and Technological Reluctance; and (4) Progressive Practice and Lack of Opportunity. Each group was examined in terms of classroom practices and educational objectives, teachers' perceptions of themselves and their students, conceptualizing the relationship between technology and education, integrating technology into the curriculum, how teachers got involved with technology, facilitating factors, deterring factors, and envisioning future classroom environments. Results indicate that unless teachers are personally ambivalent about computers or have lacked the opportunity to get involved with computer technology, their educational beliefs play an important role in how they choose to appropriate and make use of technologies in their classrooms. (14 references)

ED332250
Student Responses to Computers: A Longitudinal Study.
Krendl, Kathy A.; Broihier, Mary
May 1991, 20p. Paper presented at the Annual Meeting of the International Communication Association (41st, Chicago, IL, May 23-27, 1991).
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Computers; *Educational Media

Using R. E. Clark's concept of media attributions, a study examined the evolution of fourth through tenth grade students' perceptions about computers on three dependent variables—preference, perceived learning, and perceived difficulty, over the course of 3 years. Subjects were 339 public school students in Tennessee who completed a self-administered questionnaire. Findings demonstrated clear evidence of novelty effects. Students' judgments regarding preferences for computers declined significantly as did their perceptions of learning from the technology during the 3 years. Perceived difficulty of using computers, which was expected to decline, remained stable. In addition, both gender and age proved to be significantly related to all three dependent variables. Older students were consistently more skeptical about the technology than were younger students, and boys were consistently more positive than girls. These relationships showed no evidence of change over the course of 3 years. The results support critiques of the methodological limitations of the dominant approach to the study of computer effects in learning environment. Reports of short-term experimental applications of the technology have led to misleading generalizations about the computer's instructional potential. (33 references)

ED323943
Effects of Animated Visuals on Incidental Learning and Motivation.
Rieber, Lloyd P.
Feb 1990, 12p. In: *Proceedings of Selected Paper Presentations at the Convention of the Association for Educational Communications and Technology*; see ED 334 969.
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Animation; *Computer Assisted Instruction; *Computer Graphics; *Incidental Learning; *Science Instruction; *Student Motivation

This study examined the effects of animated presentations on intentional and incidental learning and the degree to which computer practice activities contained intrinsically motivating characteristics as measured by continuing motivation. A total of 70 fourth graders participated in an introductory lesson on Newton's laws of motion. Two levels of visual presentation (static graphic and animated graphic) were crossed with two levels of practice order (questions/simulation and simulation/questions). Within-subject factors consisted of learning intent (intentional or incidental), visual testing format (all verbal or verbal and visual), and test interval (immediate or delayed). Results showed that animated graphics successfully promoted incidental learning. In addition, students overwhelmingly chose to return to the structured simulation practice when placed in a free-choice situation. (33 references)

ED335006
The Effects of Visual Grouping on Learning from Computer Animated Presentations.
Rieber, Lloyd P.
1991, 10p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology*; see ED 334 969.
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Animation; *Computer Assisted Instruction; *Computer Graphics; *Instructional Effectiveness; *Visual Stimuli

The effects of visual grouping strategies involving animated and static graphic presentations on learning were studied. Also studied was the ability of students to learn a scientific rule presented incidentally in an animated sequence in the hope of replicating results from previous research. A total of 39 fourth graders participated in an introductory lesson on Newton's laws of motion. Two levels of Visual Presentation (Static Graphic, Animated Graphic) were crossed with two levels of Visual Grouping (Grouped, Ungrouped). A within-subjects factor consisted of two levels of Learning Intent (Intentional, Incidental). Results showed that students given animated presentations of lesson content outperformed students receiving static presentations, but only when the animated lesson frames were presented in groups, or "chunks," of textual and visual sequences. These results demonstrate how students' selective attention toward information contained in animated visuals can be undermined when the presentation insufficiently cues their focus of attention to the animated sequence. These results also illustrate at least one possible strategy which can be used to improve the ability of students to attend to and learn from animated visuals. Results also showed that students were successfully able to extract information pertaining to an application of Newton's second law incidentally presented in animated sequences. These results successfully replicate earlier findings indicating that elementary school students can learn and apply incidental information from an animated display without necessarily sacrificing intentional learning. (21 references)

ED327140
Perceived Locus of Control and Computer-Based Instruction.
Swan, Karen; And Others
Apr 1990, 13p. Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16-20, 1990). For a related paper, see ED 327 142.
EDRS price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Academic Achievement; *Computer Assisted Instruction; *Educationally Disadvantaged; *Locus of Control; *Student Attitudes

Research on perceived locus of control indicates that there is a positive correlation between internal locus of control and a variety of cognitive behaviors associated with academic achievement, that the perceived locus of control of educationally disadvantaged students is more external than average, and that the perceived locus of control of such students can be made more internal through intervention. Findings also suggest that computer based instruction (CBI) classroom environments that are student-centered and cooperative, and promote individualized instruction, may change the perceived locus of control of the students involved to one in which they believe themselves to be more in control of their own learning. Analyses of interviews conducted with 197 teachers and 718 students participating in New York City's Computer Pilot Program for educationally disadvantaged students in grades 3-12, the standardized test scores of 3,795 students, and classroom observations support the efficacy of CBI for the delivery of basic skills remediation to these students. It is suggested that the success of the CBI programs evaluated is derived at least in part from the effects of the CAI environment on the students' perceptions of control over their own learning. (28 references)

ED331480
Attitudes toward Personal and School Use of Computers.
Troutman, Andria P.
Feb 1991, 11p. Paper presented at the Annual Conference of the Eastern Educational Research Association (Boston, MA, February 13-16, 1991).
EDRS price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150); Test, Questionnaire (160)
Major Descriptors: *Computer Uses in Education; *Microcomputers; *Student Attitudes; *Use Studies

This report presents the findings of a survey of 292 preservice teachers concerning their attitudes toward the personal use and school use of microcomputers. The students' attitudes were measured on a variety of issues including computer assisted instruction, feasibility of computer use, value of computer use, confidence in personal ability to use computers, and interest in using computers. An additional purpose of the study was to design two Likert attitude scales, one for attitudes toward the use of computers in schooling, and the other for attitudes toward personal use of computers. The method used to design the questionnaire is discussed as well as the research method used to validate the two attitude scales. Results of the survey indicated that students who feel secure in their own personal use of computers also feel positive toward the use of computers in schools. Copies of both attitude scales are provided. (3 references)

Testing

ED326201
Modifying Multiple-Choice Questions in Computer-Based Instruction.
Clariana, Roy B.
16 Oct 1990, 10p.
EDRS price: MF01/PC01 plus postage.
Document Type: Position Paper (120); Research Report (143)
Major Descriptors: *Comprehension; *Computer Assisted Testing; *Measurement Techniques; *Multiple Choice Tests; *Test Construction; *Test Items

Research has shown that multiple-choice questions formed by transforming or paraphrasing a reading passage provide a measure of student comprehension. It is argued that similar transformation and paraphrasing of lesson questions is an appropriate way to form parallel multiple-choice items to be used as a posttest measure of student comprehension. Four parallel items may be derived from a lesson: (1) an item that is neither transformed nor paraphrased, thus testing simple rote memory; (2) an item that is

transformed only; (3) an item that is paraphrased only; and (4) a compound item that is both transformed and paraphrased. These four items produce a hierarchy of difficulty from easy (rote) to difficult (compound), depending on the extent to which an item is altered from the original lesson question. In the three studies cited in this paper, posttest performance for the four types of items followed the hypothesized hierarchy of difficulty, and this is viewed as evidence that many of the cognitive skills underlying comprehension may also be hierarchically related. It is concluded that the formation of test questions from lesson items provides a practical way for designers to utilize multiple-choice items for instruction and also for posttest assessment.

ED324339
User's Guide to the Testing 1-2-3 Test Development and Delivery System.
Edwards, Ethan A.
Illinois University, Urbana. Computer-Based Education Research Laboratory.
Aug 1990, 49p. Figures contain small print.
EDRS price: MF01 plus postage. PC not available from EDRS.
Document Type: Non-Classroom Material (055)
Major Descriptors: *Computer Assisted Testing; *Test Construction

Testing 1-2-3 is a general purpose testing system developed at the Computer-Based Education Research Laboratory at the University of Illinois for use on NovaNET computer-based education systems. The testing system can be used for: short, teacher-made quizzes, individualized examinations, computer managed instruction curriculum testing, standardized tests, certification tests, and practice examinations. This system currently supports four test item types: multiple choice, multiple selection, short answer, and numeric. Options for result reporting include overall pass/fail scores, individual criteria for up to 26 subscores, and storage and viewing of a student's complete test history. Testing 1-2-3 is structured around several lists of component parts in a single file. Each test is created by specifying which parts will be combined to create a particular test. This guide discusses the following topics: (1) getting started; (2) creating test items; (3) the text mode; (4) the graphics mode; (5) the locate mode; (6) editing displays; (7) shared graphic resources; (8) making section pages; (9) gathering items into tests; (10) customizing tests; (11) testing under the SYS 4 Management System; and (12) assigning tests to students. Sample computer visual displays are illustrated in 22 figures.

ED328587
Computer-Based Assessment of Cognition: The ETS Factor Kit.
Ekstrom, Ruth B.; Bejar, Isaac I.
Aug 1990, 17p. Paper presented at the Annual Meeting of the American Psychological Association (98th, Boston, MA, August 10-14, 1990).
EDRS price: MF01/PC01 plus postage.
Document Type: Evaluative Report (142); Conference Paper (150)
Major Descriptors: *Cognitive Tests; *Computer Assisted Testing; *Educational Trends; *Factor Analysis; *Test Construction

The history of the Educational Testing Service (ETS) Factor Kits is summarized. The original ETS Factor Kit was developed in 1954 and contained 51 items, three each for each of 15 factors and six for a 16th factor. The next edition was developed in 1963 and included adaptations (clones) of the defining tests instead of the exact copies. These tests marked 24 factors. The current edition of the ETS Factor Kit was developed in 1976 and consists of 72 tests marking 23 cognitive factors. Some limitations of paper-and-pencil versions of the kits are identified, and computer-administered versions being developed are described. Information is given about a study comparing computer and paper-and-pencil tests. The Factor Kit tests were intended to be used as markers in factor-analytic studies of cognition and have been widely used in psychological research. Tests that could be used to determine a number of major factors were assembled in "kits" for factorial research. Limitations of the format restricted the kinds of cognitive processes that could be assessed and the ways in which tests could be scored. Questions of test misuse arose. Creating computer-administered versions posed a number of problems in the areas of timing, confirmation and correction of responses, and pacing. For the computer administered versions, system features are described. A small pilot study compared the two formats using data for 30 secondary school students aged 13 to 19 years, who took part of each kit of 10 tests in each format. Results suggest that the factors measured by these 10 tests were not affected by the use of the computer version. Versions of the computer-administered kit for field testing are anticipated in 1992. Three tables provide details about the 1954, 1963, and 1976 editions of the Factor Kits. A 17-item list of references is included.

ED323244

A Computer Needs Analysis Model for School District Testing and Evaluation Offices.

Fisher, Sylvia Kay; Shibutani, Hirohide

Florida Journal of Educational Research, v30 n1 p45-58 Fall 1988
1988, 16p.
EDRS price: MF01/PC01 plus postage.
Document Type: Journal Article (080); Research Report (143)
Major Descriptors: *Computer Networks; *Management Information Systems; *Needs Assessment; *School Districts; *Systems Analysis; *Testing Programs

A generalizable systems-based needs analysis model was developed to help school district testing and evaluation offices evaluate current problems with their information processing systems and identify additional computer capabilities required to upgrade their systems. The model contains four main phases, namely: definition of the department function and operations; implementation of a needs analysis; analysis of specific problems and potential solutions; and development of a computer network model to alleviate the verified problems. Areas covered by the model include computer software, computer system components, prototype model evaluation, allocation of personnel, computer capabilities, problem and solution inspection, and development of a network model. The model was implemented with the Pinellas County (Florida) School District Department of Program Evaluation and resulted in a cost-effective prescription for improving its current computer capabilities. One important feature of the needs assessment model was the involvement of staff members at each stage of the study. By the time the final proposal was made, staff members could clearly see that it addressed their needs. Three figures and one table are included.

Subject Areas

Business

ED334379
Standardized Curriculum for Business Technology.
Mississippi State Department of Education, Jackson. Bureau of Vocational, Technical, and Adult Education.; Mississippi State Department of Education, Jackson. Office of Vocational, Technical and Adult Education.
1988, 202p. For related documents, see ED 334 372-404.
EDRS Price: MF01/PC09 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Business Education; *Core Curriculum; *Information Processing; *Office Automation; *Programing; *State Standards

Standardized curricula are provided for five courses for the secondary business technology programs in Mississippi: intensive business training; information processing; business computer applications; and computer programing technology (CPT) I and II. The 20 units of intensive business training include the following: keyboarding; operation of photocopy equipment; selecting and purchasing supplies; using references and resources; word processing; recordkeeping; database management; accounting; telephone techniques; and filing. Thirteen units in information processing include the following: keyboarding; making travel arrangements; planning and organizing meetings; word processing; database management; and machine transcription. Business computer applications has 14 units that include data management; word proccessing; electronic spreadsheet; integrated applications; computerized graphics; automated accounting; computerized filing; BASIC programing; computerized financial applications; and electronic communications. The nine units in CPT I and the nine units in CPT II include the following topics: hardware; software; data organization; computer operations; BASIC and COBOL language syntax and programing applications; software evaluation; and careers. Each unit consists of these components: objectives, with core/essential objectives indicated; suggested instructional practices; list of suggested resources; list of evaluation and suggested minimum performance standards, with core/essential objectives indicated; and performance record, with core/essential objectives indicated. A checklist for each course combining all unit performance standards into a single list is included.

ED325082
Computer Applications I & II. Revised.
North Carolina State Department of Public Instruction, Raleigh. Division of Vocational Education.
1990, 606p.
Report No: VEC-BOE-CG-6411; VEC-BOE-CG-6412
EDRS Price: MF03/PC25 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Business Education; *Computer Software; *Job Skills; *Microcomputers; *Office Automation

This sequence of courses is designed to teach students how to use computers as a business and personal tool through the use of application software. Various jobs in computer-related fields are examined and employability skills, proper work habits, and leadership skills are taught. The major part of the guide consists of 18 units of instruction: (1) "Proper Care of Equipment and Materials"; (2) "Basic Functions of a Computer System"; (3) "Current Issues and Careers"; (4) "Leadership Skills"; (5) "Database Management"; (6) "Spreadsheet"; (7) "Graphics"; (8) "Word Processing"; (9) "Integrated Software"; (10) "Telecommunications"; (11) "Utilities"; (12) "Project Management"; (13) "Management Support"; (14) "Desktop Publishing"; (15) "Presentation Graphics"; (16) "Evaluating Software"; (17) "Appropriate Work Habits"; and (18) "Seeking Employment." These units are written for courses to be offered during a 2-year period. Course outlines in the preface of the document suggest what should be taught in levels one and two. Each unit includes a table of contents, competency objectives, student activities, handouts, transparency masters, evaluation measures, a key to test items, and references.

ED330846
Marketing Education Computer Curriculum. Final Report.
Pittsburgh University, Pa. School of Education.
30 Jun 1988, 60p.
Sponsoring Agency: Pennsylvania State Department of Education, Harrisburg. Bureau of Vocational and Adult Education.
EDRS Price: MF01/PC03 plus postage.
Document Type: Project Description (141); Test, Questionnaire (160)
Major Descriptors: *Competency Based Education; *Computer Managed Instruction; *Computer Software Development; *Educational Needs; *Marketing; *Menu Driven Software

A project developed computer software based upon Interstate Distributive Education Curriculum Consortium (IDECC) competency-based materials to produce a new curriculum management system for Pennsylvania secondary marketing education programs. During the project, an advisory committee composed of secondary marketing teachers, business people, and computer consultants was formed. The committee assisted in the construction of a survey instrument designed to assess the computer curriculum needs of the state's secondary marketing education teachers. The survey was mailed to the 134 teachers listed in the 1986 Pennsylvania Marketing Education Association Directory. Usable surveys were returned by 83 (63 percent) of the teachers. Data gathered in the survey supported the need for a marketing education computer curriculum management software program. The program was then developed using a menu-driven system consisting of student and competency databases. (Attachments to the report include a 17-item bibliography and 9 appendices: a list of IDECC competencies for the Pennsylvania Scope of Instruction in marketing, the survey form, correspondence, advisory committee members, advisory committee meeting agendas, memos, and a rating of 16 computer software programs.)

English as a Second Language and Foreign Languages

ED333730
Components of a CALL Teacher Training Workshop.
Baltra, Armando
Mar 1991, 14p. Paper presented at the Annual Meeting of the Teachers of English to Speakers of Other Languages (25th, New York, NY, March 1991).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *English (Second Language); *Language Teachers

A 2-day teacher training workshop in computer-assisted language learning (CALL) designed for teachers of English as a Second Language (ESL) is described. Program objectives included the following: awareness of computer uses consistent with current principles of second language learning; direct experience with computers, emphasizing what can go wrong, and why; teacher acquaintance with effective software for the machines available to them; provision of guidelines for software evaluation; and participant awareness of sources of information in CALL. The workshop begins with a discussion of the role of computers in ESL and of software types. The bulk of the program is devoted to laboratory exploration of specific software, including courseware, word processing and text construction programs, games and simulations, and desktop publishing. A list of references and sources for individual programs is included, and a classification for software and guidelines for software review are appended.

ED332521
K-12 Foreign Language Software Products Bibliography.
Becker, James E.
Iowa State Department of Education, Des Moines. Bureau of Instruction and Curriculum.
1991, 125p.
EDRS Price: MF01/PC05 plus postage.
Document Type: Bibliography (131)
Major Descriptors: *Courseware; *Second Language Instruction

Computer software for elementary and secondary school second language instruction produced by 55 companies is listed and briefly described. The information is organized by company. Each company listing includes the publisher's address and telephone number and citations for each relevant computer pro-

gram. For each program, information on price, program capabilities, hardware requirements, and languages available is provided, when applicable. Additional sections contain lists of computer productivity materials, electronic gradebooks, accessories and related products, lists of peripherals, publications, and ancillary materials, a reprinted list of sources of language software, videodisc sources for foreign languages, and word processing programs for the Macintosh.

ED331328
Project CLASS: A Computer Literacy for All Support System for Teachers, Lab Aides and Potentially English Proficient Adults.
LaFlamme, Kathleen
Nov 1990, 109p. M.S. Practicum, Nova University.
EDRS Price: MF01/PC05 plus postage.
Document Type: Project Description (141); Practicum Paper (043)
Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; *Language Teachers; *Literacy Education; *Teacher Aides

The development and implementation of a computer literacy support system to increase student computer use for language learning are described. The system was piloted with teachers and a computer laboratory aide in an urban program of adult basic education and English as a Second Language. The project had three phases, including: review of existing software and development of materials, with terminal competency objectives; on-site staff development workshops; and a five-week period during which students were introduced to basic computer skills by teachers, and students' use of computers before and after the teacher/aide training was tracked in activity logs. Teachers and aide were pre- and post-tested for computer skills, and computer lab activity logs were analyzed. Staff knowledge was found to have increased substantially, meeting stated objectives. However, staff who had not been computer literate previously did not gain the desired confidence in their computer usage ability. Student use of computers increased dramatically during and after the staff training period, to five times the baseline (pre-training) usage. Recommendations include repetition of the workshops for new staff, extension of the support system to serve evening classes, and adaptation of the workshop outlines for other training situations. System materials and pilot data are appended.

ED332546
"CALL" in the Heart of Darkness: A Research into the Place of "CALL" in TESOL.
Tutunis, Birsen
1990, 12p. Paper presented at the International Conference of the International Association of Teachers of English as a Foreign Language (24th, Dublin, Ireland, March 27-30, 1990).
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *English (Second Language); *Teaching Methods

This study is an inquiry into the integration of computer-assisted language learning (CALL) into the teaching of English to speakers of other languages (TESOL), and focuses on the relationship of computers within a variety of British educational establishments in the county of Sussex (England). The aims of the study were: (1) to examine how TESOL teachers are trained and what the position of CALL is in this process; (2) the look at TESOL practice and find out whether or not CALL is integrated to TESOL; and (3) to look at the implementation of CALL within these two settings in order to see its effectiveness as compared with the previous application of CALL in TESOL.

ED334823
Desktop Design for ESOL Teachers.
Walker, Susan
[1991], 15p. Paper presented at the Annual Meeting of the Teachers of English to Speakers of Other Languages (25th, New York, NY, March 24-28, 1991).
EDRS Price: MF01/PC01 plus postage.
Document Type: Teaching Guide (052); Conference Paper (150)
Major Descriptors: *Desktop Publishing; *English (Second Language); *Illustrations; *Layout (Publications); *Material Development; *Teacher Developed Materials

The guide for teachers of English as a Second Language offers practical advice for teachers on the format and layout of instructional materials to be produced using desktop publishing technology. An introductory section discusses important design considerations for producing effective materials. Subsequent

sections describe how to: organize ideas; outline the text; choose an overall style; design the page; select a type design and page format specifications; organize text for visual effect; select or write text; and choose illustrations. Samples of materials are provided, including a glossary, a map, a chart or graph, simple text, a lesson page, and a page from a student-designed book.

Language Arts

ED326884
Integrating Computers into the Language Arts Curriculum.
Bright, Twyla L.
8 Nov 1990, 34p. Paper presented at the Annual Indiana Fall Language Arts Conference (Bloomington, IN, November 8, 1990).
EDRS Price: MF01/PC02 plus postage.
Document Type: Conference Paper (150); Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Language Arts; *Writing Attitudes; *Writing Instruction

Every dedicated educator should take the time to integrate the computer into the learning program of his or her classroom. Although studies have reported no significant differences in the achievement of word processing students, teachers using word processing in their classrooms are all enthusiastic about the results, especially regarding students' receptivity and response. Word processing does not teach writing, but it is an efficient tool which can be used effectively in the classroom. The best way for an educator to achieve a practical, working knowledge is to use the computer and word processing to write something that is very important. The educator who is integrating the use of the computer as a tool in his language arts classroom must remember that he or she is not teaching keyboarding but writing and must begin with a well organized plan. It is crucial that the teacher provide the same type of feedback and response that the students would receive when working with pencil and paper. Students have pointed out a variety of positive aspects of using the computer and do not perceive the assignments as being difficult when asked to revise using a computer. Writing is viewed as fun if they do it on the computer. Additional software that is like a workbook will be just as effective as a workbook. Providing this software will depend on time and funds. (Computer research findings, lesson plans, and sample pages of student work are included; 14 references are attached.)

ED326866
Roles for Computers in Teaching the English Language Arts. Technical Report No. 522.
Bruce, Bertram C.
Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois University, Urbana. Center for the Study of Reading.
Dec 1990, 16p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Review Literature (070)
Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *English Instruction; *Language Arts

This report discusses some of the wide-ranging applications of computers and electronic networks now being used in all facets of teaching the English language arts. The report discusses examples of computer applications grouped into five roles: (1) tutors—computers individualize instruction, provide learning material at a controlled pace, and record student progress; (2) tools—computers aid in reading, allow students to produce and format texts easily, facilitate revision of texts, and store all sorts of information for learners; (3) ways to explore language—computers make the regularities, beauties, and difficulties of language something that students can examine and interact with in new ways; (4) media—computers make possible new modes of communication; and (5) environments for communication—computers permit new forms of meaningful communication and reconfigure the relationships among students and teachers. (41 references)

Mathematics

ED334971
Mathematics Problem Solving within a Cooperative Learning Computer Structure.
Arenz, Bernard W.
1991, 24p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology*; see ED 334 969.
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Simulation; *Cooperative Learning; *Mathematics Skills; *Problem Solving; *Skill Development

Mathematics problem solving skills need to be developed through meaningful interactions. Computer simulations combined with cooperative learning methods provide students a context within which to construct an understanding of mathematics problem solving. This study examines the distribution and sequence of events that result in acquisition of those problem solving skills. Subject pairs of middle school age were observed solving mathematics problems presented by a computer simulated microworld. It appears that a complex set of strategies resulting in successful solution of the mathematics problems are developed by the subjects during the successful completion of the computer simulation and those strategies may be acquired within pairs of subjects. This study indicates that for this limited case mathematics problem solving skills along with cooperative communications can be a positive supplement to more traditional instruction. However, additional work in this area is indicated to assess the extent and magnitude of the learning taking place during the completion of the computer simulation. (2 figures, 43 references)

ED332874
Improving the Problem Solving Skills of At-Risk High School Mathematics Students through Cooperative Work Groups and Computer-Assisted Instruction.
Brickle, Woodrow, II
Dec 1990, 76p. Ed.D. Practicum Report, Nova University.
EDRS Price: MF01/PC04 plus postage.
Document Type: Practicum Paper (043); Test, Questionnaire (160)
Major Descriptors: *Computer Assisted Instruction; *Cooperative Learning; *High Risk Students; *Mathematics Instruction; *Potential Dropouts; *Secondary School Mathematics

The negative impact of low attendance and the lack of effective, alternative classroom learning strategies are factors that mitigate against student interest and success in mathematics, particularly with respect to inner-city at-risk students. The goal of this practicum was to improve the problem-solving skills of a group of 50 alternative high school students by strengthening these students' appreciation of and interest in mathematics, by increasing students' schedule of attendance in scheduled mathematics classes, and by improving students' performance on the school's standardized basic skills test in mathematics. For a period of three months, computers, manipulatives, cooperative groups, and Socratic questioning in the mathematics classroom were used to address a variety of learning preferences. No measurable differences could be noted from the pre- and post-test interest survey responses. However, improved student performance and documented increases in class attendance suggest that the design of mathematics instruction to accommodate differences in students' learning preferences is an effective strategy for addressing the unique needs of the at-risk alternative high school student. The report includes 28 references and the student and teacher questionnaires.

ED323115
Mathematics/Computer Integrated Curriculum, Grade 3.
Cartwright, Lisa; Wallace, Tracey
Aug 1990, 36p. For related documents, see ED 323 113-118.
Sponsoring Agency: Texas Higher Education Coordinating Board, Austin. EDRS Price: MF01/PC02 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Course Content; *Elementary School Mathematics; *Grade 3; *Graphs; *Mathematics Education

This manual designed for grade 3 is part of a series for a program to integrate the teaching and learning of mathematical and computer concepts and skills in the elementary school. The manual contains 20 les-

sons. Each lesson includes information on the topic, suggested grade level, mathematics concepts and skills, objective, prerequisite skills needed, and activities. Topics contained in the lessons include: (1) problem solving; (2) geometry; (3) numbers; (4) measurement; (5) number concepts; (6) addition; (7) time; (8) LOGO; (9) division; (10) fractions; and (11) probability, statistics, and graphing. Software programs used for the activities are specified for each lesson.

ED323113
Mathematics/Computer Integrated Curriculum, K-1.
Cauthen, Lavetia; And Others
Aug 1990, 69p. For related documents, see ED 323 114-118.
Sponsoring Agency: Texas Higher Education Coordinating Board, Austin.
EDRS Price: MF01/PC03 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Course Content; *Elementary School Mathematics; *Grade 1; *Kindergarten

This manual designed for kindergarten and grade 1 is part of a series for a program to integrate the teaching and learning of mathematical and computer concepts and skills in the elementary school. The manual contains 41 lessons. Each lesson includes information on the topic, suggested grade level, mathematics concepts and skills, objective, prerequisite skills needed, and activities. Topics contained in the lessons include: (1) problem solving; (2) geometry; (3) numbers; (4) measurement; (5) number concepts; (6) addition; (7) comparing; (8) estimating; (9) time; and (10) fractions. Software used for the activities is primarily LOGO.

ED334061
The Design and Analysis of a Mathematical Microworld.
Edwards, Laurie D.
Apr 1991, 16p. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, April 3-7, 1991).
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Cognitive Development; *Computer Assisted Instruction; *Discovery Learning; *Learning Strategies; *Mathematics Instruction; *Middle Schools

One class of interactive, computer-based learning environments (microworlds) for the exploration of school mathematics (and science) entails the incorporation of appropriate concepts within the engaging context of self-directed discovery learning. The objective of this research was to investigate and describe in detail the constructive learning process of children who interacted with a computer microworld that incorporated the central objectives and relations of transformational geometry. The qualitative model in this research focused on discerning changes in students' content knowledge, changes in their strategies for using the microworld environment, and changes in their goal behavior. Included in the report are the theoretical framework, methods of data collection, preliminary results, and examples of microworld activities. Even though the small sample size of this case study (n=12) prevented tests for statistical significance, specific results included an increase of 9 percent on the most difficult transformation task (identifying rotations) to an increase of 25 percent on the easiest task (executing reflections). Further, the results yield support for previous conclusions that students require meaningful problem-solving activities to facilitate the construction of new knowledge. (11 references)

ED325106
Computer-Integrated Instruction Inservice Notebook: Secondary School Mathematics.
Franklin, Sharon, Ed.; Strudler, Neal, Ed.
International Council for Computers in Education, Eugene, Oreg.
1988, 310p. For related documents, see ED 325 105-108. The two Macintosh 800 diskettes that accompany the notebook are not included in this document.
Sponsoring Agency: National Science Foundation, Washington, D.C.
Report No: ISBN-0-924667-55-9
Available From: International Council for Computers in Education, 1787 Agate Street, Eugene, OR 97403 (1-4 copies, $40.00 each prepaid).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Teaching Guide (052); Non-Classroom Material (055); Book-Product Review (072)
Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; Databases; *Inservice Teacher

Education; *Secondary School Mathematics; *Secondary School Teachers; *Teaching Methods

The purpose of this notebook is to assist educators who are designing and implementing inservice education programs to facilitate the effective use of computer integrated instruction (CII) in schools. The book is divided into the following five sections: (1) Effective Inservice (a brief summary of inservice literature focused on inservice dimensions and design principles); (2) Background Information (an overview of computers in education and a discussion of the roles of computers in problem solving); (3) Initiating/Planning an Inservice (suggestions for preliminary planning and activities and a sample timeline for those activities); (4) An Eight-Session Mathematics Inservice (2-hour sessions on graphing to represent data, graphing equations, spreadsheets, problem solving, introduction to database software, geometry and visualization, inverted curriculum, and project reports and closure); and (5) Instruments and Evaluation (a variety of instruments for needs assessment, formative evaluation, and summative evaluation). Each 2-hour mathematics inservice session contains some or all of the following: narrative overview, script (topics, objectives, materials, activities), timeline, handouts, and readings. References are listed in the first three sections and a software bibliography is included in the fourth section.

ED324217
Mathematical Problem Solving: A Review of the Literature.
Funkhouser, Charles
[1990], 43p.
EDRS Price: MF01/PC02 plus postage.
Document Type: Review Literature (070)
Major Descriptors: *Cognitive Structures; *Computer Assisted Instruction; *Memory; *Problem Solving

The major perspectives on problem solving of the twentieth century are reviewed—associationism, Gestalt psychology, and cognitive science. The results of the review on teaching problem solving and the uses of computers to teach problem solving are included. Four major issues related to the teaching of problem solving are discussed: (1) translation training; (2) schema training; (3) strategy training; and (4) algorithm automaticity. The use of computers and problem solving, problem solving environments, the use of artificial intelligence in problem solving, and the impact of computer programming on problem solving are considered. Included is a bibliography of 71 references.

ED323116
Mathematics/Computer Integrated Curriculum, Grade 4.
Gee, Stephanie
Aug 1990, 23p. For related documents, see ED 323 113-118.
Sponsoring Agency: Texas Higher Education Coordinating Board, Austin. EDRS Price: MF01/PC01 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Course Content; *Elementary School Mathematics; *Grade 4; *Learning Activities; *Mathematics Education

This manual designed for grade 4 is part of a series for a program to integrate the teaching and learning of mathematical and computer concepts and skills in the elementary school. This manual contains 16 lessons. Each lesson includes information on the topic, suggested grade level, mathematics concepts and skills, objective, prerequisite skills needed, and activities. Topics contained in the lessons include: (1) problem solving; (2) geometry; (3) numbers; (4) measurement; (5) number concepts; (6) LOGO; and (7) puzzles. Software programs used for the activities are specified for each lesson.

ED323118
Mathematics/Computer Integrated Curriculum, Grade 6.
Glidewell, Kathleen; Johnson, Ava Carol Oakes
Aug 1990, 53p. For related documents, see ED 323 113-117.
Sponsoring Agency: Texas Higher Education Coordinating Board, Austin.
EDRS Price: MF01/PC03 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Course Content; *Elementary School Mathematics; *Grade 6; *Graphs; *Mathematics Education

This manual designed for grade 6 is part of a series for a program to integrate the teaching and learning of mathematical and computer concepts and skills in the elementary school. The manual contains 34 lessons. Each lesson includes information on the topic, suggested grade level, mathematics concepts and

skills, objective, prerequisite skills needed, and activities. Topics contained in the lessons include: (1) problem solving; (2) geometry; (3) numbers; (4) number concepts; (5) computer commands; (6) fractions; and (7) graphing. Software programs used for the activities are specified for each lesson.

ED323114
Mathematics/Computer Integrated Curriculum, Grade 2.
Guss, Michael; And Others
Aug 1990, 46p. For related documents, see ED 323 113-118.
Sponsoring Agency: Texas Higher Education Coordinating Board, Austin.
EDRS Price: MF01/PC02 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Course Content; *Elementary School Mathematics; *Grade 2; *Learning Activities

This manual designed for grade 2 is part of a series for a program to integrate the teaching and learning of mathematical and computer concepts and skills in the elementary school. The manual contains 34 lessons. Each lesson includes information on the topic, suggested grade level, mathematics concepts and skills, objective, prerequisite skills needed, and activities. Topics contained in the lessons include: (1) problem solving; (2) geometry; (3) numbers; (4) measurement; (5) number concepts; (6) addition; (7) time; (8) patterns; and (9) making inferences and drawing conclusions. Software programs used for the activities are specified for each lesson.

ED334195
Using Hypertext To Develop an Algorithmic Approach to Teaching Statistics.
Halavin, James; Sommer, Charles
[1990], 8p.
EDRS Price: MF01/PC01 plus postage.
Document Type: Evaluative Report (142)
Major Descriptors: *Algorithms; *Authoring Aids (Programing); *Computer Assisted Instruction; *Hypermedia; *Statistics; *Teaching Methods

Hypertext and its more advanced form Hypermedia represent a powerful authoring tool with great potential for allowing statistics teachers to develop documents to assist students in an algorithmic fashion. An introduction to the use of Hypertext is presented, with an example of its use. Hypertext is an approach to information management in which data are stored in a network of nodes, or frames, connected by links. Nodes can contain text, graphics, audio, video, source code, or other forms of data. The designer of the document creates the nodes on a word processor, statistical package, or graphics program; he or she may go forward or backward through the links created. Hypertext documents are easy to use, although the number of levels of linkage should be kept to a minimum for students. Such documents are not as easy to create, requiring the creation of text files, linkage files created with Hypertext software, and graphics files. A sample Hypertext document is described for student learning about hypothesis tests for a single sample containing a parameter measuring the central tendency of the population. It is predicted that, in time, the text for an elementary statistics course will be a Hypertext document. Two sample flowcharts for use in the Hypertext document are provided.

ED326386
Increasing the Skill and Knowledge Level of Low Level Students on Linear Equations.
Handelsman, Kenneth G.
May 1989
52p. M.S. Practicum, Nova University.
EDRS Price: MF01/PC03 plus postage.
Document Type: Practicum Paper (043); Test, Questionnaire (160)
Major Descriptors: *Algebra; *Computer Assisted Instruction; *Equations (Mathematics); *Problem Solving; *Secondary School Mathematics

This practicum describes a computer assisted instructional (CAI) program written in the computer language BASIC. This computer program was designed to help 11th and 12th grade algebra students (n=15) better understand the concept of linear equations. The program has three sections: the first is a tutorial, the second section gives the student the opportunity to answer questions on linear equations with immediate feedback, and the last section is a test. With this CAI program, teachers will have an alternative method of teaching algebra other than with a textbook and chalkboard. After 4 weeks of use, students in

the target group showed significant gains in their abilities to write linear equations. Included in this study are the purpose, research and solution strategy, methodology, results as well as a copy of an attitudinal survey, and recommendations. Appended are test results from the district, school, and classroom, copy of the pretest and posttest, instructions for utilizing the CAI program, and a flowchart of the program.

ED334062
Discrete Mathematics across the Curriculum, K-12. 1991 Yearbook.
Kenney, Margaret J., Ed.; Hirsch, Christian R., Ed.
National Council of Teachers of Mathematics, Inc., Reston, Va.
1991, 248p.
Available From: National Council of Teachers of Mathematics, Inc., 1906 Association Drive, Reston, VA 22091 ($18.00; members, bookstores, and orders of 10 or more—20% discount).
Document not available from EDRS.
Document Type: Book (010); Collection (020)
Major Descriptors: *Algorithms; *Computer Uses in Education; *Mathematics Curriculum; *Mathematics Instruction; *Problem Solving

This yearbook provides the mathematics education community with specific perceptions about discrete mathematics concerning its importance, its composition at various grade levels, and ideas about how to teach it. Many practical suggestions with respect to the implementation of a discrete mathematics school program are included. A unifying thread throughout the book is that discrete mathematics incorporates many of the recommendations found in the Curriculum and Evaluation Standards for School Mathematics of the National Council of Teachers of Mathematics. Contents include: (1) Perspectives and Issues (rise to prominence, implications, and cautions); (2) Teaching in Grades K-8 (strengthening traditional curricula through problem-solving approach); (3) Teaching in Grades 7-12 (appropriateness for both precollege students and noncollege-intending students); (4) Graph Theory (formulation of real-world applications of algorithmic thinking); (5) Matrices (computer-based storage and manipulation of numerical data); (6) Counting Methods (enhancement of combinatorial reasoning with manipulatives dominoes, geometric concepts, and generating functions); (7) Recursion, Iteration, and Induction (spreadsheet programs and computer graphics as tools to explore concepts and applications); (8) Algorithms (thinking procedurally without the rigor of computer programming); and (9) Units, Activities, and Projects (open-ended, relevant problems lead to debate and discussions among students).

ED325522
Understanding the Role of Linguistic Processes in the Solution of Arithmetic Word Problems.
LeBlanc, Mark D.
1990, 11p.
EDRS Price: MF01/PC01 plus postage.
Document Type: Evaluative Report (142)
Major Descriptors: *Arithmetic; *Cognitive Processes; *Computer Assisted Instruction; *Problem Solving; *Psycholinguistics; *Word Problems (Mathematics)

Ongoing work toward developing a learning environment that will perform real-time diagnoses of students' difficulties in solving mathematical word problems is described. The learning environment designed consists of a microworld and expert modules. The microworld (or toolbox) is a collection of mouse-driven interfaces that facilitate a transition between manipulative models of arithmetic word problems (such as those using physical blocks) to the more abstract symbolic models (such as an open-sentence equation). The expert module is composed of mathematical and linguistic problem solving models. A linguistic or reading expert first generates a conceptual representation of the actions and sets in a word problem, and the mathematical expert then attempts to assign part-whole roles to the conceptualized sets and arrive at a numerical model. The focus is on the expert reading model. A conceptual analyzer, EDUCE (Explaining Discourse Understanding with Conceptual Expectations), reads English word problems and generates conceptual representations of the quantities and actions in the word problem. By altering its linguistic abilities, the learning environment will perform real-time diagnoses of students' erroneous solutions and give the teacher hypotheses of potential misunderstandings. In its instructional role, EDUCE is designed to explain the role of certain words and phrases in a word problem. In its cognitive modeling role, it helps explain why some problems are harder than others. Four tables are included.

ED323117
Mathematics/Computer Integrated Curriculum, Grade 5.
Lindsey, Sue; Pitts, Hazel
Aug 1990
44p. For related documents, see ED 323 113-118.
Sponsoring Agency: Texas Higher Education Coordinating Board, Austin.
EDRS Price: MF01/PC02 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Course Content; *Elementary School Mathematics; *Grade 5; *Learning Activities; *Mathematics Education

This manual designed for grade 5 is part of a series for a program to integrate the teaching and learning of mathematical and computer concepts and skills in the elementary school. The manual contains 27 lessons. Each lesson includes information on the topic, suggested grade level, mathematics concepts and skills, objective, prerequisite skills needed, and activities. Topics contained in the lessons include: (1) problem solving; (2) geometry; (3) numbers; (4) number concepts; (5) statistics; (6) measurement; and (7) probability, statistics, and graphing. Software programs used for the activities are specified for each lesson.

ED334994
Implementation Levels of a Videodisc-Based Mathematics Program and Achievement.
Lowry, William H.; Thorkildsen, Ron
1991, 20p. In: *Proceedings of Selected Research Presentations at the Annual Convention of the Association for Educational Communications and Technology*; see ED 334 969.
Sponsoring Agency: Department of Education, Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150); Test, Questionnaire (160)
Major Descriptors: *Academic Achievement; *Interactive Video; *Program Implementation

Part of a larger project, "Technology, Educational Media & Materials—Assessing the Social and Cultural Impact of Group-Based, Videodisc Math Instruction in Mainstreamed Classrooms," this study addressed the question of whether the level of student achievement differs across levels of implementation of a mediated program that is based on a well-defined instructional model. Systematic observations of the implementation of a videodisc-based, direct instruction program, "Mastering Fractions," were conducted. The nine upper-elementary classrooms involved were spread across three school districts. Implementation/utilization of the program varied across classrooms, as did achievement. Based on the observations, three classrooms were classified as high-implementation classrooms, three as average-implementation, and three as low-implementation. At the conclusion of the field study, there was a 28-percentage-point difference between the mean gain score of the high-implementing classrooms and that of the low-implementing classrooms. When covariance-adjusted posttest means were considered, the difference was about 20 percentage points. Guidelines for teachers using the program, an implementation rating sheet, and a teacher interview questionnaire are appended. (20 references)

ED328427
How To Use the Spreadsheet as a Tool in the Secondary School Mathematics Classroom.
Masalski, William J.
National Council of Teachers of Mathematics, Inc., Reston, Va.
1990, 80p.
Report No: ISBN-0-87353-303-8
Available From: National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 22091 ($16.50).
Document not available from EDRS.
Document Type: Teaching Guide (052); Instructional Material (051)
Major Descriptors: *Computer Uses in Education; *Learning Activities; *Mathematics Instruction; *Secondary Education; *Secondary School Mathematics; *Spreadsheets

The National Council of Teachers of Mathematics has stated that computer technology is an important factor in the improvement of mathematics instruction and an important tool in mathematics instruction. Computer spreadsheets are readily adaptable for problem solving, can enhance the user's insight into the development and use of algorithms and models, free students from being hampered by laborious manipulation of numbers, and allow students to see the progression of calculations on the screen as they

are generated. This set of materials is an attempt to illustrate by example how the spreadsheet can be used in the secondary school mathematics classroom. Included in this set of materials are data disks for use with Appleworks spreadsheet and Better Working Spreadsheet software, and a teachers' guide. The teachers' guide contains an overview of spreadsheets, and directions and suggestions for use with each of the 30 spreadsheet files on the disks.

ED328407
Algebraic Thinking Tools: Supports for Modeling Situations and Solving Problems in Kids' Worlds.
McArthur, David; And Others
Rand Corp., Santa Monica, Calif.
Jul 1989, 16p.
Sponsoring Agency: National Science Foundation, Washington, D.C.
Report No: RAND/N-2974-NSF
Available From: Rand Corporation, 1700 Main Street, P.O. Box 2138, Santa Monica, CA 90406-2138 ($4.00).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Project Description (141)
Major Descriptors: *Algebra; *Computer Assisted Instruction; *Computer Software; *Mathematics Skills; *Secondary School Mathematics; *Tutorial Programs

This Note describes several versions of an intelligent tutor for basic algebra that have been developed at the RAND Corporation. The versions of the tutor were built around several core components, including an algebra expert system and a student modeling component that can make inferences about misconceptions underlying students' errors. The different versions help students learn distinct kinds of mathematical reasoning skills. The first discussion concerns the equation-solving tutor, which focuses on the acquisition of relatively low-level symbol manipulation skills. Next, the model-building tutor which helps students acquire important mathematical reasoning skills that are not part of most algebra curricula, including the ability to formulate a mathematical model of real-world situations and to test mathematical hypotheses, is discussed. This document concludes with a discussion of the implications of the tutors for curriculum change. The pedagogical approach implicit in the tutors diverges from most classroom teaching principals. An "embedded" and "global-before-local" practice is advocated.

ED334069
An Intelligent Tutor for Basic Algebra.
McArthur, David; Stasz, Cathleen
Rand Corp., Santa Monica, Calif.
Aug 1990, 71p. For a preliminary paper on this subject, see ED 300 245.
Sponsoring Agency: National Science Foundation, Washington, D.C. Directorate for Science and Engineering Education.
Report No: R-3811-NSF
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Project Description (141); Test, Questionnaire (160)
Major Descriptors: *Algebra; *Computer Assisted Instruction; *Individualized Instruction; *Mathematics Instruction; *Programed Instructional Materials; *Programed Tutoring

The stated goal of Individual Computer-Assisted Instruction (ICAI) research is the development of computer software that combines much of the subject matter being studied, any particular student's learning schema, and the pedagogical knowledge of human tutors into a powerful one-to-one learning environment. This report describes the initial steps in the research to design an intelligent tutor for basic algebra. Early observations indicated that one specific tutor version would be too limited, hence emphasis was focused on development of a generic tutor from which many tutor versions could be forged. This report documents the rationale for redirecting the overall research effort, the development of the generic tutor, the development of tutor versions from that generic model, and the efforts to evaluate those various tutor versions. The following are included: (1) an introduction with research goals and report organization; (2) a rationale for development of a core tutor and an outline of its components; (3) the physical specifications of the core tutor and design specifications of three tutor versions—the passive tutor, the multiple-representations tutor, and the goal-commands tutor; (4) an empirical evaluation and subsequent analysis of the passive tutor and its uses; (5) the conclusions drawn from this stage of ICAI research with prospects for future directions; (6) the student attitude/background survey and the mathematics achievement test used in the assessment procedure; and (7) 37 references.

ED335230

Mathematics: Promising and Exemplary Programs and Materials in Elementary and Secondary Schools. Mathematics Education Information Report.

Mizer, Robert; And Others

ERIC Clearinghouse for Science, Mathematics, and Environmental Education, Columbus, Ohio.

Dec 1990, 67p.

Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.

Available From: ERIC Clearinghouse for Science, Mathematics and Environmental Education, The Ohio State University, 1200 Chambers Rd., Room 310, Columbus, OH 43212 ($10.00).

EDRS Price: MF01/PC03 plus postage.

Document Type: Project Description (141); ERIC Product (071)

Major Descriptors: *Computer Uses in Education; *Elementary School Mathematics; *Interdisciplinary Approach; *Mathematics Education; *Problem Solving; *Secondary School Mathematics

This document contains 29 programs and/or material listings that were nominated by at least three persons and for which there was evidence of the quality of the program or materials. Reviewers looked for positive evaluation data on the impact of the materials on students, or other information that assessed the quality of the program or materials, or both. This resulted in a selected listing of programs and materials. Print and/or nonprint materials for students' use also had to be available. Programs and materials are listed in three sections: Elementary-Secondary (K-12), Elementary (K-9), Middle, High School, and College. Program titles include: (1) "Add-Ventures for Girls": "Building Math Confidence"; (2) "EQUALS"; (3) "Family Math"; (4) "Florida Middle Grades Mathematics Instructional Model"; (5) "Great Exploration in Math and Science (GEMS)"; (6) "Activities to Integrate Mathematics and Science (AIMS)"; (7) "Figure Out"; (8) "Integrating Science, Math, and Technology (K-6)"; (9) "It Figures"; (10) "Instructional System in Mathematics (ISM)"; (11) "Jostens Learning Mathematics Curriculum"; (12) "LINK: A Middle School Math/Science Program for Excellence"; (13) "Math Their Way"; (14) "Math Works"; (15) "Project SEED"; (16) "Solve It"; (17) "TERC Used Numbers Project: Collecting and Analyzing Real Data"; (18) "Think About"; (19) "The Algebra Project"; (20) "Applied Mathematics"; (21) "Contemporary Precalculus through Applications"; (22) "Early Placement Evaluation in Mathematics (EPEM)"; (23) "Fifth-Year Math Program"; (24) "Math A—Fresno Unified School District"; (25) "Practical Mathematics I and II"; (26) "Teaching Remedial Mathematics to Students with Learning Disabilities"; and (27) "University of Chicago School Mathematics Project." Each section includes the title, source(s), audience, description, production date, evaluation and/or comments, materials available, and the address of a contact person. Four resource organizations and 11 references are listed.

ED326388

The Effectiveness of Computer Assisted Instruction on Children's Mathematical Problem-Solving Ability.

Pettit, Amy D.

Apr 1986, 109p. M.S. Practicum, Nova University.

EDRS Price: MF01/PC05 plus postage.

Document Type: Practicum Paper (043)

Major Descriptors: *Computer Assisted Instruction; *Elementary School Mathematics; *Estimation (Mathematics); *Individualized Instruction; *Mathematics Skills; *Problem Solving

Activities were provided for a target group of third grade students who were experiencing difficulty in mastering the skills required to solve problems involving money. The program's aims were to remediate these students by giving them the opportunity to use instructional software that would increase their mathematical vocabulary, strengthen the logic behind their thought patterns, and assist them in mastering the skills necessary to solve word problems with confidence and success. Developed and implemented was a computer program that included reading, understanding, analyzing, estimating, and computing with regard to the solving of word problems having to do with money and the making of change. Each of the students in the target group was given a pretest, an attitudinal survey, and a posttest. Results indicate that the students in the target group improved their ability to solve word problems concerning money and the making of change. The attitudinal survey indicated that the students gained both confidence and a feeling of success. Included in this study are the purpose, research, method, results, and recommendations. Appended are the minimal standards for the county and state in which the research was done, sample tests, parental survey form, software evaluation form, letters from both principal and teachers, and a documentation packet on the computer program that was used.

ED326391
Understanding Word Arithmetic Problems. Linguistic and Situational Factors.
Reusser, Kurt
Apr 1990, 24p. Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 16-20, 1990).
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *College Mathematics; *Comprehension; *Computer Uses in Education; *Problem Solving; *Reading Skills; *Word Problems (Mathematics)

Mathematical word problems are notoriously difficult to solve for students at all grade levels. Performance deficiencies have been attributed to students lacking abstract logico-mathematical knowledge or to insufficiently developed language comprehension skills. At least four general sources of difficulty can be distinguished in mathematical word problems: (1) the verbal formulation of the problem text; (2) the structure of the underlying episodic problem situation; (3) the conceptual logico-mathematical or arithmetical knowledge about set relations; and (4) the arithmetic problem solving skills that are required to perform counting operations or to resolve equations. This paper describes a process model Situation-Problem-Solver (SPS) computer program that constructs a problem representation based on strategies that take into account the specific situational structure as well as its wording. Discussed in this study is the role of two linguistic and of one situational factors on comprehension difficulty of simple mathematical word problems. The linguistic form factors that were manipulated concerned the narrative focus of the problem episode and the problem question. The results of this experiment indicate the script factor to be a dominant source of comprehension difficulty.

ED335220
Teaching Two-Step Numerical Problem Solving to Elementary School Students through Computer-Assisted Instruction.
Schuman, Jonathan C.
Mar 1991, 121p. M.S. Practicum Report, Nova University.
EDRS Price: MF01/PC05 plus postage.
Document Type: Practicum Paper (043); Test, Questionnaire (160)
Major Descriptors: *Computer Assisted Instruction; *Elementary School Mathematics; *Learning Disabilities; *Learning Modalities; *Mathematics Instruction; *Small Group Instruction

Previous research has indicated that numerically based problem-solving can be taught to children and that it should be initiated on a continuing basis in the elementary school years, yet there is no evidence for the existence of an exact, comprehensive process through which problem-solving with numerical comparisons and addition or subtraction operations can be effectively taught to children. The ability of 6 second- and third-grade students with various learning difficulties to use problem-solving skills in making decisions about open arithmetic sentence comparisons through computer-assisted instruction was examined during a 6-week summer program. Within self-paced environments monitored by a graduate student, pairs of students made independent use of various computer softwares modified to suit individual needs across several learning modes. The results indicated that single-step problem solving can be taught in a relatively short period of time using computer assisted instructional strategies. However, complex problem solving, which involved critical thinking and multiple tasks beyond mere recognition and memorization, was not fully attainable by second- and third-grade students with learning difficulties, particularly within such a short learning period. (Appendices include 22 references, pretests, posttests, student instructional preference survey, software recommendation sheet, and student data in the form of a daily log.)

ED335221
The Development and Preliminary Evaluation of Anchored Instruction Environments for Developing Mathematical and Scientific Thinking.
Sherwood, Robert D.
Apr 1991, 31p. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (Lake Geneva, WI, April 7-10, 1991).
EDRS Price: MF01/PC02 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Computer Software Evaluation; *Elementary School Mathematics; *Mathematics Instruction; *Problem Solving; *Videodisks

Prior to college-level mathematics coursework, students are not routinely provided with the opportunity to engage in the kind of sustained mathematical thinking necessary to solve complex, multistep problems, most likely because of the difficulties that school mathematics teachers face in communicating problem settings and contexts that are motivating and complex, yet ultimately resolvable by students. This paper outlines the theoretical base, development, and preliminary evaluation of anchored instructional environments (videodiscs) being used with middle-grade students to improve mathematical and scientific thinking processes. Discussed are the proactive motivation due to the video-based format including an embedded data design, the de-emphasis on reading due to a familiar narrative format, the discovery-based learning inherent in student-generated problem resolution, the implicitly manageable levels of complexity, and the possibilities for connections across the school curriculum. Initial preinstruction studies on 12 college students and on 12 high-achieving sixth graders induced extremely poor performance results by the sixth graders, which was not surprising both in view of the less than mediocre performance results of the college students, and in light of the realization that students cannot be expected to exhibit skills that have not yet been developed. (25 references)

ED335216
Computer Assisted Mathematics Prescription Learning Pull-out Program in an Elementary School.
Swarm, Christine C.
[Jul 1991], 13p.
EDRS Price: MF01/PC01 plus postage.
Document Type: Project Description (141); Research Report (143)
Major Descriptors: *Computer Assisted Instruction; *Elementary School Mathematics; *Individualized Instruction; *Instructional Improvement; *Intervention; *Learning Activities

Summaries of recent research have found computer-assisted instruction to be a highly motivating method of instruction that fosters independent study and provides for the immediate feedback necessary for the encouragement of individualized learning. A nonexperimental study was conducted with fourth, fifth, and sixth grade students (n=88) in a Chicago public elementary school who were from 1 to 2.5 years behind in their mathematics achievement scores. The students were from a wide variety of ethnic groups with over 80% of the students speaking English as a Second Language. These students visited a computer laboratory once per week for a 40-minute period and received an individually prescribed learning packet of computer-assisted programs. The results from these students' end-of-the-year mathematics achievement tests indicated significant gains in their scores. Further, there appeared to be a positive relationship between the performance of these students on the achievement test and their mathematical conceptual performance in their prescribed learning participation within the computer-assisted instructional program.

ED324474
GED Math—A Computer Assisted Mathematics Curriculum.
Zellers, Robert W.; And Others
Adult Education Services, Johnstown, PA.
30 Jun 1990, 232p.
Sponsoring Agency: Pennsylvania State Department of Education, Harrisburg. Division of Adult Basic and Literacy Education Programs.
Available From: AdvancE, PDE Resource Center, 333 Market Street, Harrisburg, PA 17126-0333 (document and related Apple-compatible disk).
EDRS Price: MF01/PC10 plus postage.
Document Type: Project Description (141); Teaching Guide (052);
Instructional Material (051)
Major Descriptors: *Computer Assisted Instruction; *High School Equivalency Programs; *Mathematics Curriculum; *Mathematics Instruction

The first document in this set is a final report titled "Preparation for the Mathematics GED Test: A Computer Based Program," which describes a project to develop a General Educational Development (GED) mathematics preparation program for the adult learner at the 9-12 grade level. The other two documents are a teacher's guide and a student workbook, which together with a computer software package comprise the GED mathematics program for adult learners at the 9-12 grade level. The teacher's guide includes program purpose and instructions for the teacher, instructions for the student, answer key for the student workbook problems, and diagnostic examination with an answer key. The student workbook contains explanation and examples as well as exercises for each of the five units of the program. Each unit consists of one to five chapters. Units are: (1) number relationships (whole numbers, fractions, decimals

and percent); (2) measurement (length and height measurement, weight measurement, liquid measurement, metric system); (3) data analysis; (4) algebra (arithmetic operations using integers, algebraic equations, inequalities, equations in two variables); and (5) geometry (geometric terms, geometric shapes, volume, coordinate geometry, word problems).

Music

ED332399
Computer-Assisted Instruction in Treble Clef Note Reading for Gifted, Primary Students.
Craig, Patricia D.
Jan 1988, 60p. Practicum Report, Nova University.
EDRS Price: MF01/PC03 plus postage.
Document Type: Practicum Paper (043)
Major Descriptors: *Academically Gifted; *Computer Assisted Instruction; *Music Reading

A program was developed using computer-assisted instruction to enable gifted primary-level students to learn the basic elements of note reading in the treble clef at individual speeds and without stress of competition. The target group was selected from students enrolled in beginning and advanced ukulele classes. The computer-assisted instruction included identification of the music staff, note reading on the treble clef, identification of ledger lines, identification of the music alphabet, word spelling using the music alphabet, and practice in decoding a message using the musical alphabet in combination with the English alphabet. Students applied note-reading skills by preparing and performing a recital piece. All seven of the participants scored at least 80% on a post-test, and all seven of the students were successful in preparing and presenting a recital piece. Appendices contain a list of characteristics of gifted students, a ukulele contract, pre/post-test, form for student evaluation of the program, project outline, documentation for the computer software used, and excerpts from student journals. (8 references.)

ED328480
How Computers Are Used in the Teaching of Music and Speculations about How Artificial Intelligence Could Be Applied To Radically Improve the Learning of Compositional Skills. CITE Report No. 6.
Holland, Simon
Open University, Walton, Bletchley, Bucks (England). Institute of Educational Technology.
1986, 35p. For related documents, see ED 328 481-483.
EDRS Price: MF01/PC02 plus postage.
Document Type: Evaluative Report (142)
Major Descriptors: *Artificial Intelligence; *Computer Assisted Instruction; *Interactive Video; *Musical Composition; *Music Education

This paper forms part of a preliminary survey for work on the application of artificial intelligence theories and techniques to the learning of music composition skills. The paper deals with present day applications of computers to the teaching of music and speculations about how artificial intelligence might be used to foster music composition in the future. The field of music composition makes use of computer aided instruction in the areas of music theory, music history, and aural testing. Music Logo, the use of the programming language, Logo, to create music, is another application of computer technology to music. Computerized musical instruments allow students to compose and play music at their own level; to listen and adapt these compositions; and to analyze existing music for pitch, note intervals and values, and pattern recognition. Interactive videogames provide untrained students with opportunities to compose music and hear it immediately and to teach musical transformations through simple visual manipulation of music. In the future, artificial intelligence may make modest contributions to support the learning of music composition in the areas of intelligent tutors that focus on music theory, aural training, harmonization, and some highly formalized and artificial styles of composition. Intelligent tools in the form of editors, instruments, and analytical aids along with educational games also could help students learn about music composition. The document contains 16 figures.

Reading

ED334552
Improving Spelling in the Low Level Reader through Computer-Aided Instruction and Computer-Managed Instruction.
Bollman, Betty L.
Jul 1991, 104p. M.S. Practicum, Nova University.
EDRS Price: MF01/PC05 plus postage.
Document Type: Practicum Paper (043)
Major Descriptors: *Computer Assisted Instruction; *Computer Managed Instruction; *Reading Improvement; *Spelling Instruction

To raise the spelling test scores of the lowest-level readers and poorest spellers in a third grade class, a practicum developed and implemented a spelling improvement program. Various strategies were implemented to allow for different learning modalities. Multi-sensory activities, computer managed instruction, and computer assisted instruction were used to reinforce letter-sound relationships and improve contextual understanding of the words. Improved reading scores as a by-product of spelling improvement was measured. The Sucher-Allred Word Recognition Test as a pre- and post-test measured reading growth. Results indicated increased achievement in spelling for 100% of the target group. Reading advancement was measurable in 4 of the 8 students, while areas of growth were measurable in the other 4 students. Increased understanding and experience with spelling words had a definite impact on the success of the target students' spelling. (Twelve references and 6 appendixes—containing unit cloze paragraphs, unit crossword puzzles, unit word searches, the word recognition test, student research scores, and a software evaluation form—are attached.)

ED324629
A Computer Based Program to Improve Reading and Mathematics Scores for High School Students.
Bond, Carole L.; And Others
28 Oct 1988, 16p. Paper presented at the Annual Meeting of the College Reading Association (32nd, Atlanta, GA, November 28-30, 1988).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Cognitive Style; *Computer Assisted Instruction; *High School Seniors; *Mathematics Achievement; *Reading Achievement; *Receptive Language

A study examined the effect on reading achievement, mathematics achievement, and ACT scores when computer based instruction (CBI) was compressed into a 6-week period of time. In addition, the effects of learning style and receptive language deficits on these scores were studied. Computer based instruction is a primary source of instruction that does not require supplements or book-type follow-up, in contrast to computer assisted instruction which supplements instruction that has been planned and delivered primarily by a teacher. Subjects, 62 high school seniors attending urban schools in a large metropolitan city, were divided into experimental and control groups. Seven test instruments were first administered to all subjects. Students had all scored below the 50th percentile in either reading, mathematics, or language. Classes met 2 hours twice a week for 6 weeks, and were held in a computer laboratory containing a WICAT educational system. Results indicated that statistically significant gains were made in reading and mathematics when CBI was compressed into 6 weeks. Results showed no relationship between learning style and achievement. Moreover, students with receptive language deficits achieved as well as their non-language deficit peers using this non-oral method. The effectiveness of CBI instruction is directly contingent upon the depth, quality, and range of software and its capacity for matching instruction with ability levels and needs of students. (18 references)

ED323924
Paper versus CRT—Are Reading Rate and Comprehension Affected?
Clausing, Carolyn S.; Schmitt, Dorren R.
Feb 1990, 16p. In: *Proceedings of Selected Paper Presentations at the Convention of the Association for Educational Communications and Technology*; see ED 323 912.
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Intermode Differences; *Microcomputers; *Reading Comprehension; *Reading Rate; *Text Structure

During the past century, most research addressing the legibility of text in print has used adult subjects. The study reported in this paper investigated differences in reading rate and comprehension scores of eighth grade students reading from paper copy or computer screen. Three hundred eighth grade students in computer literacy classes were randomly assigned to 10 treatment groups. Subjects were timed as they completed a cloze reading passage, decided which words were missing, and wrote those words on an answer sheet. This time was used as the reading rate. Passages were subsequently scored, and the scores were used as the comprehension rate. Subjects all read the same passage, but the passage was presented in one of 10 different text presentation modes involving variation in line length, background and foreground color, and contrast ratio in order to facilitate comparisons among the treatment groups. Two one-way ANCOVAs were used to analyze the data; one ANCOVA analyzed reading rate while the other analyzed the comprehension scores. The finding of no statistically significant differences in reading rate for any of the 10 groups conflicts with most of the findings from adult reading rate research, suggesting that reading level might be a factor affecting reading rate from electronic screens or paper. The finding of no difference in comprehension was consistent with previous studies. Thus, the ability of adults or eighth grade students to comprehend text does not appear to be impaired by the decreased legibility of computer screens. (27 references)

ED326836
The Impact of the Computer on the Teaching of Reading: A Review of the Literature.
Darter, Clarence L., Jr.; Phelps, Lucy N.
[1990], 31p.
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Review Literature (070)
Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *Reading Instruction; *Reading Research

A review of the literature on the use of the computer in teaching reading included studies that centered on basic reading skills and studies that, for the most part, supported the use of computer assisted instruction (CAI) to assist in developing these skills. The research indicated that CAI in reading is effective for a wide variety of reading skills and concept areas. Many researchers believed and produced evidence that the computer has already begun to bring students great benefits, such as better, more comfortable and faster learning of basic reading skills. CAI has been effective in raising reading achievement, especially when used to supplement regular teacher-presented instruction, and has produced a decided advantage in reducing the time taken to learn. Some investigators believed computers were more effective with younger students. The research dealt with diverse age levels, and varied from the intellectually handicapped to the gifted and talented. CAI has had a positive effect on student and teacher attitudes and motivation. A few research studies found no advantage in using CAI to increase student achievement since scores on post-tests were no better than those which involved only traditional methods. However, even those studies suggested that there were other advantages, such as student motivation, saving of teachers' time, savings of students' learning time, and opportunities for increased practice and reteaching. The computer is limited in its ability to contribute to this literacy only by man's capabilities and imagination. (34 references)

ED327810
Using Computers in Reading Instruction.
Irwin, Martha; And Others
Michigan Reading Association. 1987, 7p.
EDRS Price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Teaching Guide (052); Bibliography (131)
Major Descriptors: *Computer Uses in Education; *Microcomputers; *Reading Instruction; *Writing Instruction

The two components of this document are: (1) a brief position paper; and (2) a related but independent bibliography of references on using computers in reading/writing instruction. The paper presents six recommendations for the intelligent use of computers in the teaching of reading and composition, discussing the guidelines of the International Reading Association, integration within the curriculum, selection of software, access to hardware and software, consultation with parents, and preparation of teachers. The bibliography lists references which may help people keep up to date with the rapid developments in technology and their applications to language arts instruction. It lists 9 journals and newsletters of professional organizations as well as 18 books dealing with issues and practical suggestions for using computers in reading/writing instruction.

ED327832
Literacy: The Impact of Technology on Early Reading.
Shaver, Judy C.; Wise, Beth S.
Dec 1990, 14p. Paper presented at the Annual Meeting of the American Reading Forum (11th, Sarasota, FL, December 12-15, 1990).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150); Projecct Description (141)
Major Descriptors: *Beginning Reading; *Computer Assisted Instruction; *Instructional Effectiveness; *Microcomputers; *Program Effectiveness; *Whole Language Approach

In reflecting on an overview of research on microcomputers in the public schools, a researcher found that early programs were largely based on a programmed instruction model. Computers were primarily used to provide for simple repetition of low-level decoding tasks. The emphasis of whole language literacy is in direct contrast to this approach. Rather than teaching the various aspects of communication as separate entities, whole language focuses on the integration of the communication skills of listening, speaking, writing, and reading. The computer can be a valuable tool for helping to immerse children in an environment in which print is filled with meaning. A computer-based program, "Writing to Read," was developed by IBM to enhance writing and reading skills of kindergarten and first grade students by increasing students' understanding of sounds, words, and sentence structure. Based on the success nationally of the "Writing to Read" program, 20 "Writing to Read" programs funded by state grants in Louisiana were evaluated to determine their effectiveness. Results revealed similar statistics to those found nationally: (1) increased gain scores on word recognition and vocabulary; (2) improved writing samples; (3) increased ability to remain on task; (4) greater self-confidence; (5) fewer retentions; and (6) enthusiastic support from teachers and parents. An IBM "Writing to Read" lab was installed in a local Chapter 1 school in a low socioeconomic area. Results after the first full year of operation are similar to results achieved state-wide. (Three tables of data are included.)

ED333393
The Computer as an Aid to Reading Instruction. Learning Package No. 27.
Simic, Marge, Comp.; Smith, Carl, Ed.
Indiana University, Bloomington. School of Education.
1990, 50p. For other learning packages in this series, see ED 333 367-416.
Available from: Learning Packages, ERIC/RCS, Indiana University, Smith Research Center, Suite 150, 2805 E. 10th St., Bloomington, IN 47408-2698 ($14.00).
EDRS Price: MF01/PC02 plus postage.
Document Type: Teaching Guide (052); Collection (020)
Major Descriptors: *Computer Assisted Instruction; *Educational Technology; *Programed Instructional Materials; *Reading Instruction

Originally developed for the Department of Defense Schools (DoDDS) system, this learning package on computer use in reading is designed for teachers who wish to upgrade or expand their teaching skills on their own. The package includes an overview of the project; a comprehensive search of the ERIC database; a lecture giving an overview on the topic; copies of any existing ERIC/RCS publications on the topic; a set of guidelines for completing a goal statement, a reaction paper, and an application project; and an evaluation form.

Science

ED332869
A Profile of Users of a Level One Videodisc-Based Elementary School Science Program.
Barufaldi, James P.; And Others
Apr 1991, 20p. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (Lake Geneva, WI, April 7-10, 1991).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150); Research Report (143)
Major Descriptors: *Anxiety; *Educational Technology; *Elementary School Science; *Teacher Attitudes; *Videodisks

A number of studies in science education have indicated the general effectiveness of level one videodisc-based programs in improving student knowledge in the sciences. The purpose of the evalua-

tion study was to ascertain the effectiveness of the videodisc-based elementary science program in selected K-6 grade classrooms as determined by the users of the program involved in pilot testing. Thirty-six school sites in Texas were selected to participate in the piloting of the program. The study was conducted to: (1) collect information about level one users' teaching experiences, their academic specializations, and their level of experience with various forms of technology; (2) describe classroom behaviors and perceptions of students and teachers and the ecology of the learning environment; (3) determine teachers' attitudes toward technology and state anxiety toward teaching of science; (4) describe the impact of the innovation on the needs and concerns of teachers; (5) identify students' attitudes toward science/technology and interest in science outside the classroom; and (6) identify students' science content knowledge and skill development base before and after the implementation of the videodisc-based science program. Student information was collected through the administration of interviews; assessment of science-related attitudes, skills, and content; and classroom observation and administration of assessments of concerns and anxiety toward science and technology. Results indicate that teacher attitudes toward technology became significantly more positive at the culmination of the pilot testing and teacher anxiety toward teaching science was significantly less intense at the culmination of the pilot testing.

ED325107
Computer-Integrated Instruction Inservice Notebook: Secondary School Science.
Franklin, Sharon, Ed.; Strudler, Neal, Ed.
International Society for Technology in Education, Eugene, OR.
1990, 283p. For related documents, see ED 325 105-108. The accompanying 800K Macintosh disks are not included in this document.
Sponsoring Agency: National Science Foundation, Washington, D.C.
Report No: ISBN-0924667-67-2
Available From: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-9905 (1-4 copies, $40.00 each prepaid).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Teaching Guide (052); Non-Classroom Material (055); Book-Product Review (072)
Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; Databases; *Inservice Teacher Education; *Secondary School Science; *Secondary School Teachers; *Teaching Methods

The purpose of this notebook is to assist educators who are designing and implementing inservice education programs to facilitate the effective use of computer integrated instruction (CII) in schools. It is divided into the following five sections: (1) Effective Inservice (a brief summary of inservice literature focused on inservice dimensions and design principles); (2) Background Information (an overview of computers in education and a discussion of the roles of computers in problem solving); (3) Initiating/Planning an Inservice (suggestions for preliminary planning and activities and a sample timeline for those activities); (4) An Eight-Session Science Inservice (2-hour sessions include hypothesis testing using a computer, searching and sorting databases to generate and test hypotheses, creating a database for testing hypotheses, introduction to a spreadsheet, creating a spreadsheet, using an integrated package to produce a lab report, investigation of some commercially available science education software, and projects and closure); and (5) Instruments and Evaluation (a variety of instruments for needs assessment, formative evaluation, and summative evaluation). Each 2-hour science inservice session contains some or all of the following: narrative overview, script (topics, objectives, materials, activities), timeline, handouts, and readings. References are listed in the first three sections, and a software bibliography is included in the fourth section.

ED326444
The Effects of CAI and Hands-On Activities on Elementary Students' Attitudes and Weather Knowledge.
Gardner, Catherine; And Others
[1990], 8p.
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143)
Major Descriptors: *Cognitive Development; *Computer Assisted Instruction; *Elementary School Science; *Experiential Learning; *Science Activities; Science Education; *Student Attitudes

The purpose of this study was to determine if a combination of computer assisted instruction (CAI) with hands-on science activities would significantly enhance students' abilities in the cognitive and affective domains. The study consisted of three treatments. Treatment one (47 students) included a hands-on activities emphasis. A second treatment (46 students) included the hands-on activities in combination

with the Weatherschool software program. The Weatherschool Meteorology program was selected because of its compatibility with the local science curriculum topics, appropriate grade school reading level, and its flexibility to be integrated within the curriculum. The third treatment (21 students) did not contain either hands-on activities nor CAI, but employed more text-based learning. Hands-on activities appeared to increase scores from pretest to posttest. Included in this paper are the introduction, the methodology, results, summary, and implications.

ED331489
Computer Uses in Secondary Science Education. ERIC Digest.
Morse, Ronald H.
ERIC Clearinghouse on Information Resources, Syracuse, N.Y.
Apr 1991, 4p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
Report No: EDO-IR-91-1
Available From: ERIC Clearinghouse on Information Resources, Syracuse University, 030 Huntington Hall, Syracuse, NY 13244-2340 (free with stamped, self-addressed envelope while supply lasts).
EDRS Price: MF01/PC01 plus postage.
Document Type: ERIC Product (071)
Major Descriptors: *Computer Uses in Education; *Science Education; *Secondary School Curriculum

The importance of using computers in a science education class is not limited to computer-assisted instruction (CAI). Computers may also be used as an educational strategy to improve overall learning and computer literacy in students. Research has shown an improvement in academic achievement in students using computers, as well as an increase in scientific reasoning skills and scientific knowledge. Many science teachers are currently using computers to produce tests and worksheets; record, calculate, and post student grades; develop tests and worksheets; and produce supplementary items such as crossword puzzles, posters, and diagrams to support instructional activities. A small number of teachers also use computers as a component in selected laboratory activities, and students are being increasingly introduced to computer database searching. On the cutting edge of classroom computer applications, interactive video disks (on biology, earth science, physics, and chemistry) are making their way into many science classrooms. The major factor inhibiting computer use is insufficient computer hardware and software due to budgetary constraints. Ideally, students would have access to individual microcomputer workstations complete with touch-screen interactive video and high quality computer managed instruction that would allow them to proceed at their own pace. In this situation, the role of the science teacher would be dramatically different, yet just as valuable and rewarding as it is now. Science education in the future will incorporate computer use—including word processing, many forms of computer assisted instruction (CAI), laboratory instrumentation, interactive video courseware, and scientific database searching—and the educational process will be better because of it. (8 references)

ED327372
Planet Earth's Place in the Educational Sun.
Pannwitt, Barbara
National Association of Secondary School Principals, Reston, Va.
Curriculum Report, v19 n3 Jan 1990
Jan 1990, 7p.
Available From: National Association of Secondary School Principals, 1904 Association Drive, Reston, VA 22091 ($1.75 per copy, $4.00 annual subscription).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Serial (022)
Major Descriptors: *Earth Science; *Elementary School Science; *Science Curriculum; *Science Materials; *Secondary School Science; *Telecommunications

The focus of this curriculum report is on the earth sciences in the K-12 curriculum. High technologies have combined to produce telecommunications, the newest aid and impetus to earth sciences education. Listed in this report are educational service organizations and individual schools that have this service. Included are the names, addresses, and a description of each program. Examples of earth science curriculum programs are also included for both high school and elementary school. The name, address, and a description of each program is listed.

ED328443
Ideas for Integrating the Microcomputer with High School Science.
Podany, Zita
Northwest Regional Educational Laboratory, Portland, OR. Technology Program.
Nov 1990, 13p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Teaching Guide (052); Projecct Description (141)
Major Descriptors: *Computer Uses in Education; *Interviews; *Microcomputers; *Scientific Literacy; *Secondary School Science

This report discusses how computers are being used in high school science classrooms. For this report, four high school science teachers were interviewed. The approach to science instruction described in these four interviews deals with the areas of scientific and technological literacy, making science learning fun and attractive, and stimulating the use of higher-order thinking skills. All are involved in the use of computers to enhance science instruction through activities based on microcomputer-based laboratories (MBL). The four subjects are participants in one of two projects dedicated to such computer application, LabNet and StarNet. Both LabNet and StarNet, projects of the Technical Education Research Centers (TERC), and MBLs are described. The characteristics common to all four of the interviewed teachers are discussed. The advantages and disadvantages of taking this approach are presented.

ED328444
Software for Middle School Physical Science.
Podany, Zita
Northwest Regional Educational Laboratory, Portland, OR. Technology Program.
Nov 1990, 15p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Evaluative Report (142)
Major Descriptors: *Computer Software Reviews; *Computer Software Selection; *Courseware; *Middle Schools; *Physical Sciences

This final report in the MicroSIFT series reviews 10 software packages that deal mainly with the areas of electricity, magnetism, and heat energy. Software titles appearing in this report were selected because they were judged to be exemplary according to various criteria in the MicroSIFT Evaluator's Guide, with some additions to address science directly. All of the software serves to supplement regular classroom laboratory instruction. Basic computer-based tool packages were included for temperature-dependent experiments. Although the computer-based tool packages do not directly relate to electricity and magnetism, they do provide a steppingstone into using the computer as a tool to aid scientific discovery. Software packages are divided between those that use thermistor probes as lab tools and electricity and magnetism concept development software.

ED326402
Using CAI To Improve Participation and Achievement in Science Research Projects in Middle School Science.
Price, Suzanne M.
Aug 1989, 86p. M.S. Practicum, Nova University.
EDRS Price: MF01/PC04 plus postage.
Document Type: Practicum Paper (043); Test, Questionnaire (160)
Major Descriptors: *Computer Assisted Instruction; *Science Fairs; *Science Instruction; *Secondary School Science; *Student Participation; *Student Research

The high percentage of students not participating in or completing a science research project has been a recurring problem for science teachers. In this project, three variables influencing the problem are identified: (1) students' failure to engage in an active search for science research topics; (2) inadequate resource materials at the middle school level; and (3) students' failure to adequately research the topic prior to designing the experiment. Software was created for the Apple IIe computer that assisted students in their search for research topics. In addition, the software helped students conduct a literature search by offering research guidance. Finally, the software offered students specific examples of experimental designs in the areas of science that interested students. The targeted students spent two weeks using the software and an additional three weeks completing the science research projects. Stu-

dent progress was observed and recorded and an attitude survey was administered before and after the completion of the science research adventure. It was concluded that this practicum increased student motivation and interest in the science research project and resulted in higher participation in all phases of the research. The document includes the purpose of the project, a brief literature review, a summary of the methods used, results, and recommendations. Appendices include a copy of the student attitude surveys, statistics, a student guide, a teacher guide, correspondence, and summary results. (CW)

ED335208
Using Microcomputers in Teaching Science. Fastback 297.
Rakow, Steven J.; Brandhorst, Terry R.
Phi Delta Kappa, Bloomington, Ind.
1989, 40p. Photographs may not reproduce well.
EDRS Price: MF01/PC02 plus postage.
Document Type: Projecct Description (141)
Major Descriptors: *Computer Assisted Instruction; *Computer Managed Instruction; *Educational Technology; *Elementary School Science; *Science Instruction; *Secondary School Science

This booklet outlines the use of computers in elementary and secondary science classrooms. Chapters and their topics are: (1) "A Computer-Enriched Science Learning Environment" (an introduction); (2) "Computer-Assisted Learning" (lesson formats for drill and practice programs and tutorial programs, and several example programs); (4) "Computer-Enhanced Laboratory Instruction" (laboratory interfacing and reviewing several programs); (5) "Computer-Assisted Classroom Management" (grade records, test generation, equipment inventories, and the use of databases); and (6) "Emerging Technologies" (telecommunications, videodisks, and CD-ROM). A list of software sources is appended.

ED328441
Computer-Aided Environmental Education. Monographs in Environmental Education and Environmental Studies, Volume VII.
Rohwedder, W. J., Ed.
North American Association for Environmental Education, Troy, OH.
1990, 261p.
Available from: North American Association for Environmental Education, P.O. Box 400, Troy, OH 45373 ($12.00 members, $17.00 nonmembers, includes postage).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Project Description (141); Position Paper (120)
Major Descriptors: *Computer Assisted Instruction; *Computer Networks; *Elementary School Science; *Environmental Education; *Secondary School Science; *Telecommunications

With creativity and innovation, environmental educators have begun wielding the ever increasing power of computers to promote and enhance environmental education. These pioneering programs and applications are the focus of this publication. This monograph is a sampling of the potential, problems and promises of this field. The four major content areas addressed in this publication are environmental hypermedia (including interactive videodiscs); environmental simulation/modeling; interactive software; and telecommunications. A list of additional resources which are not addressed in the articles is included.

ED324219
Integrating Data Base into the Elementary School Science Program.
Schlenker, Richard M.
Dependents Schools (DOD), Washington, DC. Pacific Region.
Apr 1990, 47p.
EDRS Price: MF01/PC02 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Elementary School Science; *Inservice Teacher Education; *Middle Schools; *Scientific Methodology; *Secondary School Science

This document describes seven science activities that combine scientific principles and computers. The objectives for the activities are to show students how the computer can be used as a tool to store and arrange scientific data, provide students with experience using the computer as a tool to manage scientific data, and provide students with experience building computer data base files for use in science. Activities were introduced to elementary school teachers during an inservice workshop where they were

trained to use an AppleWorks data base program with the Apple IIGS computer. Students who conduct the activities use research team processes, data pooling techniques, and computers as they attempt to make sense out of random data. Each activity includes: (1) grade level; (2) science skills; (3) math skills; (4) computer skills; (5) vocabulary; (6) list of variables; (7) materials; (8) procedures; and (9) curriculum extensions. Topics covered are: weight and counting using toothpicks and M&M's; the student's own personal data such as height, weight, and eye color; levers; acids and bases; and fire and atmospheric pressure.

ED325331
Interactive Genetics Tutorial Project.
Wisconsin University, Madison. Dept. of Curriculum and Instruction.
1988, 194p. Document contains some light and broken type especially in Appendix D.
Sponsoring Agency: Department of Education, Washington, DC.
EDRS Price: MF01/PC08 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *College Science; *Computer Uses in Education; *Secondary School Science; *Tutorial Programs

The Interactive Genetics Tutorial (IGT) project and the Intelligent Tutoring System for the IGT project named MENDEL supplement genetics instruction in biology courses by providing students with experience in designing, conducting, and evaluating genetics experiments. The MENDEL software is designed to: (1) simulate genetics experiments that students would face in a "wet lab"; (2) give students advice on how to solve specific genetics problems; and (3) give problem-solving advice so that students would gradually build up a model of scientific inquiry. The MENDEL system described consists of a problem GENERATOR and expert problem SOLVER, several components of a TUTOR that carry out an hypothesis checking strategy, and several interface options of the GENERATOR component through which all of the other systems components interact with the student. Appended material includes: the definitions of terms used in MENDEL; a sample problem and the logic of the SOLVER; an example of an ideal justification in a tutoring system; and two research reports ("MENDEL: An Intelligent Computer Tutoring System for Genetics Problem-Solving, Conjecturing, and Understanding" and "High School Students' Problem-Solving Performance on Realistic Genetics Problems").

Social Studies

ED327465
Using Computer Databases in Student Problem Solving: A Study of Eight Social Studies Teachers' Classes.
Ehman, Lee H.; And Others
16 Nov 1990, 41p. Paper presented at the Annual Meeting of the National Council for the Social Studies (Anaheim, CA, November 16, 1990).
EDRS Price: MF01/PC02 plus postage.
Document Type: Conference Paper (150); Research Report (143)
Major Descriptors: *Case Studies; *Classroom Research; *Computer Assisted Instruction; *Databases; *Problem Solving

Recent research has shown that computer technology, including databases, is becoming a part of social studies instruction. Yet it still is not clear how teachers are using databases and what are the outcomes from such use. The research reported in this document addresses three principal questions: (1) How do teachers use computer databases in teaching problem solving? (2) What do students learn during this kind of activity? and (3) What are the enablers and inhibitors of successful database use during teaching and problem solving? A case study approach was used in exploring the answers to these questions. Eight teachers and their students were observed during at least 10 class sessions; teachers and selected students were interviewed; and written teaching plans, class materials, and student projects were reviewed. Some of the inferences drawn from the study are that: time pressure affects teachers and students alike, but there are specific techniques for making good use of time when attempting computer based problem solving; lack of student knowledge must be anticipated by the teacher, who has to incorporate specific ways of overcoming the problem in teaching; and using small non-competitive groups of students works well. A 32-item list of references is included, as are 4 tables.

ED325108
Computer-Integrated Instruction Inservice Notebook: Secondary School Social Studies.
Franklin, Sharon, Ed.; Strudler, Neal, Ed.
International Society for Technology in Education, Eugene, OR.
1990, 283p. For related documents, see ED 325 105-107. The two accompanying 800K Macintosh disks are not included in this document.
Sponsoring Agency: National Science Foundation, Washington, D.C.
Report No: ISBN-0-924667-68-0
Available from: International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-9905 (1-4 copies, $40.00 per copy prepaid).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Teaching Guide (052); Non-Classroom Material (055); Book-Product Review (072)
Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; *Inservice Teacher Education; *Secondary School Teachers; *Social Studies; *Teaching Methods

The purpose of this notebook is to assist educators who are designing and implementing inservice education programs to facilitate the effective use of computer integrated instruction (CII) in schools. It is divided into the following five sections: (1) Effective Inservice (a brief summary of inservice literature focused on inservice dimensions and design principles); (2) Background Information (an overview of computers in education and a discussion of the roles of computers in problem solving); (3) Initiating/Planning an Inservice (suggestions for preliminary planning and activities and a sample timeline for those activities); (4) An Eight-Session Social Studies Inservice (2-hour sessions cover an introduction to databases, database management systems, making your own database, an introduction to computer simulations, another simulation, teacher productivity tools, graphing to represent data, and problem solving, telecommunications, and closure); and (5) Instruments and Evaluation (a variety of instruments for needs assessment, formative evaluation, and summative evaluation). Each 2-hour science inservice session contains some or all of the following: narrative overview, script (topics, objectives, materials, activities), timeline, handouts, and readings. References are listed throughout the notebook and a software bibliography is included in section 4.

ED335287
CCA High School Social Science Curricula: U.S. Government, U.S. History, and Introductory Economics. Instructor's Guide.
Illinois University, Urbana. Computer-Based Education Research Laboratory.
Jun 1990, 100p. For a related document in the series, see ED 325 332. Cover title varies slightly.
Available from: University of Illinois, Computer-Based Education Research Laboratory, 103 S. Mathews Avenue, Urbana, IL 61801 ($5.00).
EDRS Price: MF01/PC04 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Civics; *Computer Assisted Instruction; *Economics Education; *Secondary School Curriculum; *Social Studies; *United States History

Descriptions of lessons within each of three computer-based curricula for high school students (U.S. government, U.S. history, and introductory economics) are presented in this instructor's manual. Each curriculum is divided into lesson units and covers basic concepts. The reading-level is approximately tenth grade. Each unit consists of a pretest and computer instruction. If students do not pass a pretest, they are assigned the appropriate lesson. Posttests are not given because the lessons are mastery-based and give students intensive review drills. The U.S. government curriculum is composed of six units and six lessons. The U.S. history curriculum is composed of 15 units and 15 lessons. The introductory economics curriculum is composed of five units and five lessons. This manual is intended only as a supplementary guide to the computer programs containing the lessons to be used in the classroom.

ED332950
Using Computer Assisted Instruction To Improve Student's Performance Skills in Social Studies.
Roedding, Gary R.
Jun 1990, 74p. M.S. Practicum, Nova University. Program listing printed scroll-fashion on p.61-66, without page breaks.
EDRS Price: MF01/PC03 plus postage.
Document Type: Practicum Paper (043); Project Description (141)
Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *Learning Problems; *Social Studies; *Teaching Methods

One of the problems that teachers face in a knowledge-based social studies curriculum is the diversity of academic levels in a given class. The low level learner gets lost in the rush to cover the material and keep the interest of the other students. This project implemented a computer drill and practice program for those students who consistently scored low on tests in government, world history, and U.S. history. The students used the program during 2 units or 3 times a week for about 30 minutes. The program reviewed in a drill card format pertinent facts that the students would see on tests or quizzes. The objective of the program was to increase the student's performance skills in class review and on the curriculum tests. The results seemed to indicate that there was an increase in the performance skills of those students using the program although not as much increase as had been desired. Students in the target groups scored higher on their tests and most of them demonstrated increased review time participation. Appendices include Ehman and Glenn's questions on computer activities, files available to drill, a screen display from the program, instructions used with the program, and the student's record sheet.

ED333864
Learning from Hypermedia: Making Sense of a Multiply-Linked Database.
Spoehr, Kathryn T.; Shapiro, Amy
1991, 16p. Paper presented at the Annual Conference of the American Educational Research Association (Chicago, IL, April 3-7, 1991).
EDRS Price: MF01/PC01 plus postage.
Document Type: Projecct Description (141); Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Computer System Design; *Hypermedia; *Instructional Effectiveness; *Multimedia Instruction

As a collaborative effort between Brown University (Rhode Island) and three secondary schools, an instructional hypermedia research project called ACCESS (American Culture in Context: Enrichment for Secondary Schools) has created a corpus for use at the high school level which contains a substantial amount of textual, pictorial, audio, and video materials. These materials are intended to supplement traditional courses in American history, literature, and American Studies. The goals have been to provide students with information and materials that will help integrate the three disciplines and give students a broader perspective on American culture and a structure that will encourage their active participation in the learning process. Students interact with the system through a mouse-driven interface and are able to take notes electronically as they use the system. Two studies have been conducted to identify educational and cognitive outcomes resulting from the use of hypermedia instructional environments, the basic cognitive mechanisms underlying the acquisition of expertise in non-rule-based but richly linked domains such as history and literature, and the basic principles that should underlie the construction of such a system. An underlying cognitive construct has been postulated, i.e., the conceptual neighborhood, which consists of a cluster of related facts and/or instances and the relationships between them. Systematic documentation of the relationship between students' interactions with a large hypermedia corpus and their conceptual representations derived from it has begun to show that hypermedia is an effective tool for conveying complex interrelationships between ideas for the vast majority of students. (10 references)

Vocational Education

ED327658
Basics of Desktop Publishing. Teacher Edition.
Beeby, Ellen
Mid-America Vocational Curriculum Consortium, Stillwater, Okla.
1991, 331p.
Available from: Mid-America Vocational Curriculum Consortium, 1500 West Seventh Avenue, Stillwater, OK 74074 (order no. 601601: $23.50).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Oriented Programs; *Computer Software; *Desktop Publishing; *Layout (Publications)

This color-coded teacher's guide contains curriculum materials designed to give students an awareness of various desktop publishing techniques before they determine their computer hardware and software needs. The guide contains six units, each of which includes some or all of the following basic components: objective sheet, suggested activities for the teacher, instructor supplements, transparency

masters, information sheet, assignment sheets, assignment sheet answers, job sheets, practical tests, written test, and answers to written test. Units cover the following topics: introduction to desktop publishing; desktop publishing systems; software; type selection; document design; and layout. All of the units focus on measurable and observable learning outcomes. They are designed for use in more than one lesson or class period of instruction.

ED331988
Microcomputer Software Technician Curriculum.
EASTCONN Regional Educational Services Center, North Windham, CT.
1989, 75p.
Sponsoring Agency: Connecticut State Department of Education, Middletown. Division of Vocational, Technical and Adult Education.
EDRS Price: MF01/PC03 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Competency Based Education; *Computer Oriented Programs; *Computer Software; *Course Content; *Technical Occupations

This curriculum guide, developed for high schools in Connecticut, outlines a 4-year program for training microcomputer software technicians. Following a list of nine general objectives of the program, the guide provides a list of competencies that students are expected to develop in each of the courses of the 4-year program. The guide then outlines the curriculum. Topics covered during the program include the following: computer information, issues, and impacts; introduction to microcomputers; programming using BASIC; software packages; overcoming computer anxiety; personal growth; keyboarding; communication; word processing; spreadsheets; database management; integrated packages; computer information; microcomputer maintenance; disk operating system; desktop publishing and computer art; system analysis and design; introduction to management; advanced management; telecommunications; networking; operating systems; practicum; and independent study. A student progress record form with room for recording the teaching and mastery of all the skills taught in the course is included in the document. A bibliography lists 15 texts, 9 reference works 14 software packages, 24 types of equipment, and 20 computer-assisted instructional software programs.

ED333159
Instructional Technology Applications in Vocational Education: A Notebook of Cases.
Gooler, Dennis D.; Roth, Gene L.
Northern Illinois University, De Kalb. Office for Vocational, Technical, and Career Education.
Jan 1990, 85p. Twelve pages contain text printed on dark background and will not photocopy legibly. For related documents, see ED 333 157-158.
Sponsoring Agency: Illinois State Board of Education, Springfield. Department of Adult, Vocational and Technical Education.
EDRS Price: MF01/PC04 plus postage.
Document Type: Non-Classroom Material (055)
Major Descriptors: *Educational Technology; *Integrated Activities; *Interactive Video; *Learning Laboratories; *Nuclear Power Plant Technicians; *Vocational Education

This resource book is one of a series of three information resources containing ideas about instructional technology applications and how certain technology applications may have particular relevance to vocational education. It contains descriptions of some instructional technology systems applications that are currently in use. The cases focus on: (1) two-way interactive television; (2) a networked computer-based laboratory; (3) an integrated information technology system; and (4) technology and training in the nuclear industry. For each component of each system reviewed in the cases, a need is shown, followed by an application and the outcome of that solution. The notebook is designed to help vocational educators make decisions about which technologies to use in their instructional settings and how to apply elements of various systems to their situations.

ED333157
Instructional Technology Applications in Vocational Education: A Sourcebook of Ideas.
Gooler, Dennis D.; Roth, Gene L.
Northern Illinois University, De Kalb. Office for Vocational, Technical, and Career Education.
Jan 1990, 70p. For related documents, see ED 333 158-159.
Sponsoring Agency: Illinois State Board of Education, Springfield. Department of Adult, Vocational and Technical Education.
EDRS Price: MF01/PC03 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Educational Resources; *Educational Technology; *Interactive Video; *Microcomputers; *Video Equipment; *Vocational Education

This resource book is one of a series of three information resources containing ideas about instructional technology applications and how certain technology applications may have particular relevance to vocational education. It also presents issues important for vocational educators to consider in using instructional technologies. The handbook is divided into seven chapters. Following an introduction in Chapter 1, Chapter 2 provides a background in instructional technology in general, with a focus on defining the concept. Chapter 3 describes the results of a survey about instructional technology applications in vocational education in Illinois. The chapter also provides an inventory of sources for more information about technology applications in vocational education throughout the nation. The remaining four chapters contain descriptions and analyses of four instructional technology applications that are relevant to the future of vocational education: video, microcomputers, interactive video, and integrated information systems. Each chapter contains a description of a technology, an analysis of its potentials and limitations, and ideas about how a given technology might be used to enhance the quality and effectiveness of vocational education programs. Forty references are included.

ED325660
Interactive Videodisc in Vocational Education. ERIC Digest No. 105.
Kerka, Sandra
ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, Ohio.
1990, 3p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
Report No: EDO-CE-90-105
EDRS Price: MF01/PC01 plus postage.
Document Type: ERIC Product (071)
Major Descriptors: *Educational Technology; *Interactive Video; *Optical Disks; *Vocational Education

Interactive videodisc (IVD) offers a combination of media with practical applications in vocational education. IVD is superior to videotapes and other media in quality, applicability, and effectiveness. IVD can be used in different settings and for a variety of instructional applications. Although not appropriate for every learning situation, IVD has strengths, including student control of the interaction, instant feedback, and a two-way dialogue that engages the learner mentally and physically. Vocational educators have applied IVD in various ways: to teach employability skills; to provide remedial instruction for technical students with low math skills; to provide training in safety, security, and quality standards through simulation of workplace problems; and to provide tutorial and simulation of the use of a welding torch. Key factors in using IVD in vocational education are related to instructional design, teacher role, and costs. A basic question is whether IVD is the appropriate medium for the subject or situation. IVD, a highly learner-centered medium, definitely changes the role of the teacher, who acts more as a resource person or facilitator. Although cost seems to be a barrier, most equipment is modular and additions can be made over time. (11 references)

ED329685
VTAE CIM Conference (Menomonie, Wisconsin, June 6-7, 1990). Final Report.
Lee, Howard D.
Wisconsin University-Stout, Menomonie. Center for Vocational, Technical and Adult Education.
Jun 1990, 171p.
Sponsoring Agency: Wisconsin State Board of Vocational, Technical, and Adult Education, Madison.
EDRS Price: MF01/PC07 plus postage.
Document Type: Conference Proceedings (021)
Major Descriptors: *Articulation (Education); *Computer Assisted Manufacturing; *Computer Oriented Programs; *Program Implementation; *Vocational Education; *Workshops

This document reports on a workshop conducted to bring together vocational, technical, and adult education colleges and the University of Wisconsin-Stout staff members who are working with computer-integrated manufacturing (CIM). Participants discussed current program content, identified areas that need further development, and determined how these programs can be articulated. They also worked on articulation with high schools in the area. Following a brief summary of the workshop, the document contains outlines, agendas, handouts, participant lists, a CIM strategic plan, slide script about CIM at John Deere, summaries of CIM project development at seven Wisconsin technical colleges and the University of Wisconsin-Stout, a paper titled "Articulation: The Key to Educational Transition for Students" (J. Timothy Mero), handouts from a presentation on the future of CIM, and workshop evaluation results.

ED326651
Competency Reference for Computer Assisted Drafting.
Oregon State Department of Education, Salem. Division of Vocational Technical Education.
1990, 14p.
EDRS Price: MF01/PC01 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Behavioral Objectives; *Competence; *Competency Based Education; *Computer Assisted Design; *Drafting

This guide developed in Oregon lists competencies essential for students in computer-assisted drafting (CAD). Competencies are organized in eight categories: computer hardware, file usage and manipulation, basic drafting techniques, mechanical drafting, specialty disciplines, three dmensional drawing/design, plotting/printing, and advanced CAD. Each of the four to eight competencies in each category includes a competency statement that describes the performance standard required to demonstrate proficiency in that skill.

ED324485
Computer Aided Drafting Packages for Secondary Education. Edition 1. Apple II and Macintosh. A MicroSIFT Quarterly Report.
Pollard, Jim
Northwest Regional Educational Laboratory, Portland, OR. Technology Program.
Nov 1987, 29p. For edition 2, a PC DOS version, see ED 292 988.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS Price: MF01/PC02 plus postage.
Document Type: Evaluative Report (142)
Major Descriptors: *Computer Assisted Design; *Computer Assisted Instruction; *Computer Software Evaluation; *Computer Software Reviews; *Courseware; *Drafting

This report reviews software packages for Apple Macintosh and Apple II computers available to secondary schools to teach computer-aided drafting (CAD). Products for the report were gathered through reviews of CAD periodicals, computers in education periodicals, advertisements, and teacher recommendations. The first section lists the primary considerations in choosing a good CAD system, as agreed upon by teachers: cost, ease of use, ease of setup, and availability of coordinated curriculum materials. The following important features of CAD software are also outlined: dimensioning, display, creating objects, modifying objects, snaps, output, input, and modeling. CAD programs for Macintosh and Apple II series microcomputers are reviewed in separate sections. Each section begins with a brief discussion of advantages and disadvantages of the microcomputer and software available for it. A chart comparing the features of the CAD programs for specific microcomputers follows. Each program description includes publisher name, address, and telephone number; computer name; cost; and a summary of the opinions of the teachers who reviewed the program. Four programs for the Macintosh are reviewed: MacDraft, MGMStation, MiniCAD, and VersaCAD. Four programs for the Apple II are reviewed: MATC-CAD, discoverCAD, CADApple 2D Version 3.5, and Entry Level CADApple.

Writing

ED325110
Teaching Process Writing with Computers.
Boone, Randy, Ed.
International Council for Computers in Education, Eugene, Oreg.
1989, 162p.
Report No: ISBN-0-924667-53-2
Available from: International Council for Computers in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403-9905 (1-4 copies, $15.95 each prepaid).
EDRS Price: MF01 plus postage. PC not available from EDRS.
Document Type: Collection (020); Non-Classroom Material (055)
Major Descriptors: *Computer Assisted Instruction; *Language Arts; *Teaching Methods; *Word Processing; *Writing (Composition); *Writing Instruction

This collection of articles focuses on the use of word processing software programs as instructional tools for students learning writing composition. Section 1 discusses the use of word processors as a composition tools within the process model of writing instruction and includes articles entitled "Should Students Use Spelling Checkers?," "A Recipe to Encourage Revision," "Six Directions for Computer Analysis of Student Writing," "Desktop Publishing: More Than Meets the Eye," and "Writing with Word Processors for Remedial Students." Section 2 focuses on lesson ideas, providing detailed practical applications for using computers in the context of the process approach to teaching writing. Articles include "The Computer as a Writing Tool," "Creating Writing Lessons with a Word Processor," "A Family Writing Project," "Writing Skills with Write On," and "Reading and Writing Interactive Stories." The three articles in section 3 discuss whether and how keyboarding skills should be taught. Section 4 provides reviews of 15 software packages and two articles, "Creating Software for Classroom-Specific Needs," and "Computer Use in the IBM 'Writing to Read' Project." Section 5 contains two additional articles that are suggested reading for those interested in computers and writing instruction. A 101-item bibliography concludes the notebook.

ED323927
Diagnostic Evaluation of Composition Skills: Student Choice.
Dwyer, Herbert J.
Feb 1990, 16p. In: *Proceedings of Selected Paper Presentations at the Convention of the Association for Educational Communications and Technology*; see ED 323 912.
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Evaluation Methods; *Microcomputers; *Student Evaluation; *Word Processing; *Writing Evaluation; *Writing Skills

This study investigated student preferences for either teacher-written or computer-generated marking of written compositions. Ninety-seven high school students typed assigned compositions on a word processor. Three skills pre-selected by the teacher were checked on each composition. Students were randomly assigned to treatments so that, on the first composition, half were marked by the teacher and the other half by a computer proofing program. On the second assignment, the teacher/computer groups were switched to the opposite type of marking. On a third assignment, students chose either teacher or computer marking. Results of a questionnaire showed that after experiencing both types of marking, 87% of the students selected teacher marking over computer marking. The most common reasons for selecting the teacher were the more personalized marking, ease of understanding, the marking of additional areas, and the fact that the teacher is the ultimate grader. Eighty-six percent of the students reported that they liked using word processors, and 93% reported that word processors made writing easier. (32 references)

ED332153
An Artistic Criticism of "Writing To Read," A Computer-Based Beginning Reading Program.
Huenecke, Dorothy
17 Apr 1991, 22p. Paper presented at the Annual Meeting of the American Educational Research Association (72nd, Chicago, IL, April 3-7, 1991).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150); Evaluative Report (142)

Major Descriptors: *Beginning Reading; *Computer Assisted Instruction; *Instructional Effectiveness; *Program Evaluation

A study used aesthetic criteria and artistic criticism to find meaning in one part of the kindergarten and first grade curriculum, "Writing To Read," a computer-based program for beginning reading. Subjects, students in a kindergarten class, were observed several days a week from the day in April when they began the program until the day that most of the children completed the program in December. Data consisted of brief notes made during the 25 hours of observation. Results indicated that: (1) students engaged in a slightly modified version of the program; (2) children spent time waiting to start, waiting to continue, or waiting to stop activities at each of the stations on the program; (3) interruptions were common and came from many sources; (4) control of the children by the teacher was primary; (5) the balance inherent in the design of the program was frequently compromised; (6) a disturbing lack of consistency was observed in the expectation that children be creative in writing stories and in the reality that they were not given time to create; and (7) "playfulness" was not encouraged. Findings suggest that this implementation of "Writing To Read" is not "educative"—it does not lead to mental and moral growth. (Eighteen notes are included.)

ED322720

Writing with Pen or Computer? A Study on ESL Secondary School Learners.

Li Nim-Yu, Kitty

Jul 1990, 24p. Paper presented at the Annual World Conference on Computers in Education (5th, Sydney, New South Wales, Australia, July 9-13, 1990).

EDRS Price: MF01/PC01 plus postage.

Document Type: Research Report (143); Conference Paper (150); Test, Questionnaire (160)

Major Descriptors: *English (Second Language); *Word Processing; *Writing (Composition); *Writing Instruction

A study investigated the relative effects of using computers and writing by hand on secondary students' quality or quantity of writing, and on their attitudes toward writing. Subjects were 40 eighth-grade students in an Anglo-Chinese school in Hong Kong, with some experience in writing brief compositions. The word processing program used was PC-Write, with a RAM resident 80,000-word dictionary substituted for the PC-Write dictionary. The study lasted 5 months, including a typing training session, a word-processing session, and all writing sessions. in each 80-minute writing lesson, the researcher spent 30 minutes discussing how to write an essay. A guided writing sheet was handed out, and students were divided into two groups with separate supervision, one in the computer lab and one in the regular classroom. To encourage revision, subjects could rewrite at specified times, under supervision. Essays were rated for quality by two external raters. Writing quantity was measured by the number of words written. Student attitude was assessed by questionnaire. Results show that students using computers wrote better and longer essays. All subjects showed significant changes in attitude, but neither group felt writing in English was easy or enjoyable. A 43-item bibliography, the essay rating scale, and the attitude questionnaire are appended.

ED327036

Teaching Children To Write with Computers: Comparing Approaches. The Writing Project. Technical Report No. 1.

Morocco, Catherine Cobb; And Others

Education Development Center, Inc., Newton, Mass.

Oct 1985, 31p. For related documents, see ED 296 492, ED 319 181, and ED 327 037.

Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.

Available from: The Writing Project, Educational Development Center, 55 Chapel St., Newton, MA 02160.

EDRS Price: MF01/PC02 plus postage.

Document Type: Evaluative Report (142); Non-Classroom Material (055)

Major Descriptors: *Learning Disabilities; *Teacher Role; *Teaching Methods; *Word Processing; *Writing (Composition); *Writing Instruction

This report presents first year (1984-85) findings of The Writing Project, a 2-year school-based study of the use of word processing to improve learning-disabled children's writing skills. Emphasis is on how remedial teachers can integrate computers into their writing activities in resource rooms and classrooms. Based in three Massachusetts school districts, the project focused in the first year on intensive observation of 14 fourth-grade children as they wrote with word processors. The study found that the computer

aided the child's sense of ownership, of being in control and "authoring" the writing, and of his/her involvement in writing. Teachers brought three different approaches to teaching writing with a computer: skill building; guided writing; and strategic. The strategic approach, which provided students with strategies for managing the writing process, appeared to result in the highest level of student involvement and independent work. The skill building approach resulted in the least positive impact on students' involvement and sense of ownership. A model environment for teaching writing with computers is proposed, guided by such principles as the basic capability of learning-disabled children as "authors" and the use of writing strategies that keep the child in control. Includes 21 references.

ED324685
Improve Quantity and Quality of Student Writing through the Implementation of Telecommunications and Process Writing Activities between Fifth and Sixth Grade Students.
Norris, Dolores J.
Aug 1990, 50p. Educational Specialist Practicum, Nova University.
EDRS Price: MF01/PC02 plus postage.
Document Type: Practicum Paper (043)
Major Descriptors: *Computer Networks; *Electronic Mail; *Word Processing; *Writing Improvement; *Writing Instruction; *Writing Processes

A writing program was developed and implemented, using available technology, to increase the quality and the quantity of written communication of three heterogeneously grouped classes of fifth graders. The students learned to use the word processor, Magic Slate II, for process writing assignments. A modem, Supra Modem 2400, and Proterm software were used to initiate electronic dialogs between the target group of fifth-grade students at an elementary school and the sixth-grade students at a junior high school 25 miles away. The students utilized the international news programs of the Cable News Network as a stimulus for their interaction. Results indicated increased levels of achievement in students' communication and writing skills. Findings suggest that the utilization of technology and an active audience had a positive impact on the writing process. (Six appendixes, containing a teacher survey, student survey, writing scores, concept units, student final survey, and student survey results are attached.)

ED329968
Computers Make Mark on Teaching of Writing.
Poteet, Howard
[1991], 5p.
EDRS Price: MF01/PC01 plus postage.
Document Type: Position Paper (120)
Major Descriptors: *Computer Assisted Instruction; *Computers; *Learner Controlled Instruction; *Revision (Written Composition); *Word Processing; *Writing Instruction

The most popular application of computers in the classroom is word processing. Essex County College in Newark, New Jersey, was one of the first institutions to teach students to write with the computer. Using computers in education provides the following benefits: (1) students find it easier to make changes when writing with the computer than when writing with pen and paper—thus, they tend to rewrite more to improve their writing; (2) the computer can act as instructor or tutor (using programmed instruction, for example, or hypertext); (3) computers make students learn differently, demanding that the user (the student) supply information and become involved; and (4) immense amounts of information can be stored in a small amount of space and be retrieved in seconds.

ED333761
Key Strokes: A Guidebook for Teaching Writing with Computers.
Raupp, Magda; And Others
NETWORK, Inc., Andover, MA. 1987, 83p.
Sponsoring Agency: Office of Bilingual Education and Minority Languages Affairs (ED), Washington, DC.
EDRS Price: MF01/PC04 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Assisted Instruction; *Limited English Speaking; *Literacy Education; *Revision (Written Composition); *Word Processing; *Writing Instruction

This guide is the result of three projects that have been working to address the problem of intergenerational illiteracy in writing. While writing skills are limited among the general population, they are even

more limited among limited-English-speaking students (both school-aged and adult learners). The guidebook is a self-help manual for teachers interested in helping such students write better. The guide offers ideas on how to help students manage the writing process; provides strategies for helping students generate ideas, develop audience awareness, and compose; and gives hints on encouraging students to revise papers they have already begun. The guide provides general information on the writing process as well as specific suggestions, examples, strategies, and procedures for an effective writing program. An introductory section provides an overview of research findings in writing. Implications for teaching writing are examined in section II. Subsequent sections focus on aspects of writing instruction. A 32-item bibliography is appended.

ED328911
Writing in a Computer-Saturated Classroom.
Ross, Steven M.; And Others
Nov 1990, 7p. Paper presented at the Annual Meeting of the College Reading Association (34th, Nashville, TN, November 2-4, 1990).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Uses in Education; *Word Processing; *Writing Exercises; *Writing Improvement; *Writing Instruction

A study examined questions concerning: (1) how writing was taught and integrated with other learning activities in the Apple Classroom of Tomorrow (ACOT) environment; (2) students' experiences with and attitudes toward word-processing; (3) teachers' experiences and attitudes; and (4) the influences of the computer-based activities on writing improvement. Subjects were 55 sixth-grade minority students. The research design was quasi-experimental and descriptive, involving analyses of quantitative and qualitative data obtained from teacher and student interviews, classroom observations, student and tutor surveys, and student writing samples. Results indicated a significant advantage for the ACOT group on both writing samples. Tutors felt that the electronic Bulletin Board System (BBS) had strong potential for facilitating writing skills development, but that the present program was limited by: restrictive writing features of the BBS, lack of structure in the writing activities, and the difficulty of accessing and communicating over the BBS. Teacher interviews and classroom observations revealed similar practices in the ACOT and control classes, except that ACOT students did nearly all their school and home writing assignments on the computer. The ACOT teachers strongly felt that students were more receptive to writing on the word processor and were helped by it.

ED333399
Computers and Writing. Learning Package No. 33.
Simic, Marge, Comp.; Smith, Carl, Ed.
Indiana University, Bloomington. School of Education.
1990, 52p. For other learning packages in this series, see ED 333 367-416.
Available from: Learning Packages, ERIC/RCS, Indiana University, Smith Research Center, Suite 150, 2805 E. 10th St., Bloomington, IN 47408-2698 ($14.00).
EDRS Price: MF01/PC03 plus postage.
Document Type: Teaching Guide (052); Collection (020)
Major Descriptors: *Computer Assisted Instruction; *Microcomputers; *Word Processing; *Writing Instruction; *Writing Processes

Originally developed as part of a project for the Department of Defense Schools (DoDDS) system, this learning package on computers and writing is designed for teachers who wish to upgrade or expand their teaching skills on their own. The package includes an overview of the project; a comprehensive search of the ERIC database; a lecture giving an overview on the topic; copies of any existing ERIC/RCS publications on the topic; a set of guidelines for completing a goal statement, a reaction paper, and an application project; and an evaluation form.

ED332205
Writing Achievement of Middle Level Students Using Computers To Write a Newspaper.
Steelman, Jane D.
Feb 1991, 18p. Paper presented at the Annual Meeting of the North Carolina Association for Research (Raleigh, NC, February 28-March 1, 1991).
EDRS Price: MF01/PC01 plus postage.
Document Type: Conference Paper (150); Research Report (143)

Major Descriptors: *Computer Assisted Instruction; *Writing (Composition); *Writing Achievement; *Writing Apprehension; Writing Attitudes; *Writing Instruction

An intervention study was designed to implement and evaluate an instructional program combining the writing process and computers to improve the writing quantity and quality and investigate the apprehensions of middle level students. Subjects, 75 sixth-grade students, were chosen from a relatively small rural school system. The intervention took place over approximately 28 weeks within 2 of the intact 6th-grade classrooms. The 2 experimental groups were involved in a newspaper writing program 2 days per week, 2 hours each day. A control group receiving traditional classroom writing experiences was also employed. Pretest analyses of variance determined that there were no significant differences between the groups on any of the measures used prior to the intervention. Posttest analyses of variance supported the hypotheses that the use of the writing process approach is superior to traditional methods of teaching writing and that the use of the computer enhances the process. (One figure and 3 tables of data are included and 19 references are attached.)

ED333422

"Building the Perfect Beast": Assessing the Effects of CMI (Computer-Managed Instruction) on the Teaching of, and Student Writing about, Literature.

Widdicombe, Richard Toby

19 Apr 1991, 10p. Paper presented at the Annual Conference on Computers and English (4th, Old Westbury, NY, April 19, 1991).

EDRS Price: MF01/PC01 plus postage.

Document Type: Conference Paper (150); Evaluative Report (142)

Major Descriptors: *Computer Managed Instruction; *Educational Assessment; *Literature Appreciation; *Technological Advancement; *Writing Assignments; *Writing Instruction

Measuring the effects of computer-managed instruction (CMI) on the teaching of and student writing about literature involves more than having students write and then evaluating their performance. Measurement is made difficult by the fact that the computer technology used in instruction is in a state of flux. Variation of computer technology, whether in the form of the operating system, platform, or instructional software, is profitable for its designers. The use of computers in literature instruction can mean: (1) greater creativity, because instruction is freed from the two-dimensional text; (2) more interconnectivity to the text, as a result of greater accessibility; (3) closer analysis of the text, as the mechanics of textual analysis are simpler; and (4) greater fluency in the manipulation of symbols. Many different types of assessment can be applied over a period of years. Teachers can use "process logs" to track student interaction with literature and the new technology. The "blind" reading of student essays can be replaced by a consensual assessment model, by which multiple scorers/readers assess a given essay simultaneously and anonymously. Among the dangers of CMI are that the technology will overshadow the writing and that the system will aggravate the inability of many students to concentrate.

ED331087

The English Classroom in the Computer Age: Thirty Lesson Plans.

Wresch, William, Ed.

National Council of Teachers of English, Urbana, Ill.

1991, 154p.

Available from: National Council of Teachers of English, 1111 Kenyon Rd., Urbana, IL 61801 (Stock No. 13761-0015, $12.95 members, $16.50 nonmembers).

EDRS Price: MF01/PC07 plus postage.

Document Type: Book (010); Teaching Guide (052)

Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *English Instruction; *Writing Instruction

Written by middle school, high school, and college writing teachers, the 30 lesson plans collected in this book represent a mix of computer-based units for teaching writing. They cover many types of writing from journalism to literary essays, fiction, and poetry, and many aspects of the writing process, from brainstorming for ideas to prewriting warm-ups, electronic library research, revision, and desktop publishing. Most of the lessons in the book are adaptations of lessons used for years without computers; a small number of lesson plans in the book represent wholly new activities. The lessons in the book follow a set format designed to help readers quickly find out which activities are most appropriate for them, and are divided into categories for students with little, moderate, or substantial computer experience. (A directory of software and a list of contributors are attached.)

ED331044
Potential and Actual Effects of Word Processing on Students' Creative Writing Process. No. 198.
Yau, Maria
Toronto Board of Education (Ontario). Research Department.
Mar 1991, 43p.
EDRS Price: MF01/PC02 plus postage.
Document Type: Research Report (143); Review Literature (070)
Major Descriptors: *Creative Writing; *Teacher Role; *Word Processing; *Writing Processes

A study examined the subtle impact of word processing (used alone) on the way students approach their writing tasks. Nine elementary school teachers were trained in techniques of naturalistic observation and received a kit containing important guidelines for their observational task, daily log sheets, and journal forms. The teachers then observed their students' spontaneous word processing behavior over a six-month period. The three conventional writing stages (planning, composing, and editing and revising) were used as the framework for analysis. Results indicated that to tap the full potential of word processing technology to enhance students' writing skills, several conditions must be met: (1) a teacher must be actively involved in the process both as instructor and facilitator; (2) the word processor should be employed in conjunction with, rather than in place of, other writing tools; (3) teachers and students should have enough access to computers and printers to ensure that the word processor can be fully integrated into writing classes; and (4) teachers need to be supported and facilitated. (Forty-nine references are attached.)

ED323556
WritingLands: Composing with Old and New Writing Tools.
Zeni, Jane
National Council of Teachers of English, Urbana, Ill.
1990, 212p.
Report No: ISBN-0-8141-5903-6
Available from: National Council of Teachers of English, 1111 Kenyon Rd., Urbana, IL 61801 (Stock No. 59036-3020; $9.95 members, $12.95 nonmembers).
EDRS Price: MF01/PC09 plus postage.
Document Type: Book (010); Research Report (143); Teaching Guide (052)
Major Descriptors: *Computers; *Cooperative Learning; *Writing Instruction; *Writing Workshops

Designed to help teachers, grade six through high school, overcome misgivings about computers for writing and make the most of the new technology, this book offers answers to an urgent question in language arts: how can computers be woven into the human fabric of a writing workshop? The book is based on a five-year study of computers for writing in actual school settings and presents what skilled teachers know about using computers to enhance the teaching of writing in the less than perfect conditions of ordinary classrooms. The book describes classroom environments called "Writing Lands" where computers enhance a process approach to teaching writing and makes the point that what students do with any writing tool depends less on the power of the technology than on the power of the teacher. The book also shows how teachers in the vanguard are using computers to foster collaborative writing and teacher-student dialogue, and explains how these teachers cope with the knotty practical questions computers pose in the average school. The book concludes by discussing how to design computer-equipped schools for quality writing instruction, how to choose appropriate hardware and software, and how schoolwide team leadership can support the teaching of writing. The book is organized in five major sections: (1) Portraits of Student Writers; (2) The Key Variable—Good Teaching; (3) Designing WritingLands; (4) Who Rules a WritingLand? and (5) Explorations. An appendix noting contributors to the action research and a bibliography of 113 titles conclude the book.

Special Populations

Adult Education

ED325629
Competency-Based Adult Education Teachers' Resource Guide.
Arkansas State Department of Education, Little Rock. Division of Vocational and Technical Education.
1989, 360p. Document contains colored paper which may not reproduce well.
EDRS Price: MF01/PC15 plus postage.
Document Type: Audiovisual Material (100)
Major Descriptors: *Adult Basic Education; *Competence; *Competency Based Education; *Computer Software; *Educational Resources; *Instructional Materials

This guide was developed to provide adult education teachers in Arkansas with a listing of competencies correlated with appropriate materials at each level. The guide helps teachers select materials to individualize student instructional plans. It provides a variety of alternatives such as books, workbooks, software, video, and suggested reading materials to help teachers capitalize on the learning style of the student. The guide is organized in three levels: adult basic education (ABE), pre-General Educational Development (GED) tests, and GED. Each level is sectioned into five subject areas: reading, writing, mathematics, science, and social studies. The materials are arranged alphabetically by publisher. Competencies are listed in the left margin followed by the book references with specific page numbers. Software and video materials are listed in the right column after their underlined heading. A complete index is provided, along with a listing of publishers and sources with addresses and telephone numbers. A software supplement with the same format provides additional software titles.

ED333122
Index of Workplace & Adult Basic Skills Software.
Askov, Eunice N.; Clark, Cindy Jo
Pennsylvania State University, University Park. Institute for the Study of Adult Literacy.
1989, 24p.
EDRS Price: MF01/PC01 plus postage.
Document Type: General Reference (130)
Major Descriptors: *Basic Skills; *Computer Software Reviews; *Courseware; *Daily Living Skills

This index of workplace and adult basic skills computer software includes 108 listings. Each listing is described according to the following classifications: (1) teacher/tutor tools (customizable or mini-authoring systems); (2) assessment and skills; (3) content; (4) instruction method; (5) system requirements; and (6) name, address, and phone number of publisher/distributor. A list of the 37 publishers/distributors is included. There are eight assessment and skill categories: (1) math; (2) reading, decoding, and structural analysis; (3) reading and comprehension; (4) writing and grammar; (5) writing and composing; (6) vocabulary, spelling, and meaning; (7) problem solving; and (8) complete basic skills program. Content areas include general basic skills content, workplace basic skills, job-domain related, job search and career, and English as a Second Language. Instruction methods include drill and practice, tutorial, simulation, and games and puzzles. System requirements include Apple, IBM, Tandy, Commodore, TRS-80, and Macintosh.

ED322341
Working Smart: The Los Angeles Workplace Literacy Project. Final Report.
Los Angeles Unified School District, CA. Division of Adult and Occupational Education.
Jun 1990, 119p. In partnership with Educational Data Systems, Inc., Interactive Training Inc., and Domino's Pizza Distribution Corp. For related documents, see ED 322 342-343. Appendix B contains one page with faded type and two audit forms with small type. Photographs, also, will not copy well.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC. Division of Adult Education and Literacy.
EDRS Price: MF01/PC05 plus postage.
Document Type: Research Report (143)
Major Descriptors: *Basic Skills; *Functional Literacy; *Hospitality Occupations; *School Business Relationship; *Videodisks

The Working Smart workplace literacy project was sponsored by a public school district and several profit and nonprofit companies and conducted for the hotel and food industry in the Los Angeles area. Literacy instruction was merged with job requirements of the customer service job classifications. Videodisc courseware was developed, as were student workbooks that included 9 performance modules, 13 computational modules, and 27 communications modules. Each module taught problem-solving skills, critical thinking strategies, work attitudes, and safety skills. State-certified teachers delivered the instruction. Participants were a diverse group of employees recruited through the companies' communication channels and through referrals from community adult schools; many had limited English skills. Workers were retained in the program by means of paid release time, cash bonuses, formal recognition, promotional opportunities, and a tailored assessment system. Of 92 students surveyed, 65% were very satisfied and 35% satisfied with the project. Problems encountered included: (1) sustaining corporate commitment; (2) scheduling; (3) lack of test instruments; and (4) underestimation of resource needs. Positive outcomes included an enduring relationship with employers and the development of interactive videodisc technology. An external evaluation found that students received too little interactive video instruction for conclusions about its effectiveness to be made. (The document includes project documents such as news releases, sample participant intake forms, a consultant report, and an external evaluation.)

ED333128
Technology Literacy Project. Final Financial Status and Performance Report, F.Y. 1988.
Macmurdo, Alice
Iberia Parish Library, New Iberia, LA.
1988, 32p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS Price: MF01/PC02 plus postage.
Document Type: Project Description (141)
Major Descriptors: *Adult Literacy; *Computer Assisted Instruction; *Courseware; *Literacy Education; *Reading Achievement; *Reading Improvement

A project in Iberia Parish, Louisiana, investigated whether the use of computers along with Laubach literacy materials could significantly raise the reading level of adults presently reading at the 0-4 grade levels. Adults in a control and an experimental group (15 in each) worked one-on-one with volunteer tutors using the "Laubach Way to Reading" materials. The experimental group also had computer-assisted instruction. Other project activities were the following: (1) tutors received computer training; (2) software was created to correlate with Laubach materials; (3) computer programs for adults reading at grade 5-6 levels and basic mathematics books and software were purchased; and (4) peripherals required for use with certain computer programs were purchased. There was a shift away from computer programs focusing on phonics and toward the more global, visual methods of "Project Star" software, favored by adult students. Analysis indicated that the control group showed an advancement of 0.7 grades per 50 hours of work, and the experimental group showed an advancement of 1.2 grades. Other findings were that students showed evidence of tremendous growth in self-confidence; various reading styles existed among students; and unemployed adults were using the computers to gain skills and enhance their employability. The project also acquired library materials, recruited and trained volunteer tutors, and publicized the program. (Attachments include a questionnaire and description of "Project Star" software.)

ED331475
Literacy Today: A Realtime Technology Transformation.
Mann, John G.
[1989], 15p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Book-Product Review (072)
Major Descriptors: *Computer Assisted Instruction; *Interactive Video; *Literacy; *Microcomputers

Computer assisted instruction programs for adult literacy are becoming more prevalent in learning centers, community organizations, and in schools across the country. Computers are also being used to curb illiteracy at the source, in elementary and secondary schools, in an effort to reduce dropout rates. Two IBM (International Business Machines) literacy software programs have been particularly successful in providing literacy education for both children and adults. The "Writing to Read" program is designed to teach the basic skills of reading and writing to kindergartners and first graders, and the "Principle of the Alphabet Literacy System" (PALS) interactive videodisc program is aimed at functionally illiterate

adolescents and adults. Both programs are phonetically based and offer multimedia instructional experiences through the use of computer graphics and programmed audio instruction. A Spanish language version of "Writing to Read" called VALE (Voy A Leer Escribiendo), has proven equally effective in teaching Hispanic children how to read and write in their native language. Students are engaged in independent study and proceed as quickly as their understanding allows. Effective computer software can restore the excitement of learning as well as upgrade the work force through literacy training. (13 references)

ED333124
A Survey of Adult Literacy and Technology Courseware Recommendations.
Ottawa Board of Education (Ontario). Learning Centre.
Adult Literacy Courseware Analysis and Evaluation Newsletter, v1 n2 (special issue) Oct 1989
Oct 1989, 68p.
EDRS Price: MF01/PC03 plus postage.
Document Type: Serial (022); Evaluative Report (142); Directory (132)
Major Descriptors: *Adult Literacy; *Computer Software Evaluation; *Courseware

This document provides information about computer software (courseware) used in and recommended by adult literacy programs and organizations. The information was compiled from five source documents, evaluations of or guides to adult literacy computer courseware. Section one is a general courseware information listing organized by subject. The following information is provided for each of 507 listings: (1) subject; (2) title; (3) level; (4) source (one or more of the five documents); (5) evaluation; (6) types; (7) computer system used; (8) publisher; and (9) price. Seven types of courseware are listed: (1) drill and practice; (2) exercise; (3) educational game; (4) simulation; (5) tutorial; (6) test or assessment tool; and (7) utility or tool. Section two is a listing of courseware descriptions and comments in alphabetical order by title. In the third section, addresses and phone numbers are provided for 101 courseware publishers.

ED327696
Older Displaced Workers Write To Read: A Computer-Assisted, Work-Related Basic Skills Program Using the Process Approach to Writing. Final Report.
Pennsylvania State University, University Park. Institute for the Study of Adult Literacy.
Jul 1990, 149p.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.
EDRS Price: MF01/PC06 plus postage.
Document Type: Research Report (143)
Major Descriptors: *Adult Literacy; *Computer Assisted Instruction; *Courseware; *Middle Aged Adults; *Tutoring; *Writing Instruction

A project was developed to teach literacy to adult students over 40 years old, using job-related materials in a computer-assisted approach with volunteer tutors. The project used the Penn State Adult Literacy Courseware, consisting of six computer-based modules and an Apple IIGS microcomputer. Volunteer teachers already working with adult students at the test site were recruited for participation in the project and trained in using the courseware. Adult students reading at a sixth-grade level or below who were unemployed or underemployed were targeted for the program. Tutors helped students work on modules that met their needs and interests. Throughout the project and at the end, 13 students and 14 tutors were asked about their attitudes and impressions of the project. Evaluation indicated that tutors and students showed positive attitudes and interest in the courseware. Many volunteer tutors were able to use the computers and courseware with their students by the end of the project, and students showed gains in reading and writing ability. Many student/tutor pairs were still working with the computers/courseware at the end of the project and planned to continue. The project proved, however, that learning to use computers takes time as well as support for tutors and students. (Sixteen appendices contain responses to the student attitude, student closeout, tutor attitude, and tutor closeout surveys; tutor guidelines; a 29-page program manual; a 35-page tutor's guide to the courseware; responses to the advisory board questionnaire; and guidelines for creating courseware lessons.)

ED327694
Computer Speech Devices for Adult Literacy Skills. Final Report.
Saint Paul Technology for Literacy Center, MN.
20 Mar 1990, 62p.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.
EDRS Price: MF01/PC03 plus postage.
Document Type: Project Description (141); Test, Questionnaire (160)
Major Descriptors: *Adult Literacy; *Artificial Speech; *Computer Assisted Instruction; *Courseware; *Word Recognition

A project titled "Word of Mouth" was conducted to develop and evaluate model computer courseware to teach word attack skills to adult basic education students. The project was based on the use of multiple strategies to figure out unknown words, the importance of breaking down multisyllabic words, and the necessity of the use of audio in word attack instruction. Three prototype modules with audio input and output capability were developed, featuring use of context, word parts, and spelling patterns or syllabication skills. A Macintosh computer, a MacRecorder sound system, and Telex headphones with microphone were selected. Analysis of pretests and posttests from 50 students at 2 adult literacy sites, as well as comments from participants in the development of courseware, showed that students were enthusiastic about the use of computerized speech in instruction and made significant gains in word attack skills. (Appendices provide participant comments, learners' and administrators' copies of pretests and posttests, and two articles about the program.)

Disabled

ED324839
Using Simulation Technology to Promote Social Competence of Handicapped Students. Final Report. Executive Summary.
Appell, Louise S.; And Others
Macro Systems, Inc., Silver Spring, Md.
15 Mar 1990, 146p.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC06 plus postage.
Document Type: Research Report (143); Test, Questionnaire (160)
Major Descriptors: *Computer Software; *Disabilities; *Interpersonal Competence; *Job Skills; *Simulation; *Videotape Recordings

The purpose of this project was to design and develop simulation materials utilizing vocational situations) in mildly/moderately handicapped young adults. The final product, a set of materials titled "Social Skills on the Job," includes a videotape of 15 lessons, a computer software package, and a teacher's guide, and was marketed to a commercial publisher (American Guidance Service) and made available for sale. Lessons cover such skills as calling in when sick, admitting mistakes, and dealing with criticism from an employer. This report describes the design, development and field testing of the materials, the formative evaluation, the experimental phase, and the summative evaluation. While evaluation data did not show statistically significant differences between two experimental groups and a control group, the complete set of materials was viewed by teachers as highly effective and very relevant in accomplishing objectives. Use of various media in an integrated package was rated very positive by most teachers. Appendices list review board members, present sample materials from "Social Skills on the Job," provide summaries of field test data, and include copies of assessment instruments and tables of supporting data.

ED322650
Teaching Mild to Moderately Retarded Students with Computers.
Berger, Robert
Dec 1989, 55p. Research Project, Long Island University.
EDRS Price: MF01/PC03 plus postage.
Document Type: Review Literature (070)
Major Descriptors: *Computer Assisted Instruction; *Instructional Effectiveness; *Mild Mental Retardation; *Moderate Mental Retardation; *Teaching Machines

The paper reviews the literature on use of computers with retarded students in three chapters dealing respectively with the historical context, current issues, and future directions. The chapter on the histori-

cal context reviews research on the efficacy of teaching machines with this population. Research on the effectiveness of computer-assisted instruction and computer-assisted learning as an adjunct to teacher instruction is reviewed in the second chapter. The third chapter looks at new applications of computer technology in the areas of simulation, artificial intelligence, and robotics. Each chapter has its own reference list for a total of 59 references in all.

ED332381

Planning a Needs Assessment Management System: PANAMS. Personnel Preparation for Special Education Services.

Bundschuh, Ernest

Georgia University, Athens.

1988, 96p. A part of Project PANAMS. Floppy diskettes referred to in text are available from project.

Sponsoring Agency: Office of Special Education and Rehabilitative Services (ED), Washington, DC. Division of Personnel Preparation.

Available from: PANAMS, 850 College Station Rd., Athens, GA 30610.

EDRS Price: MF01/PC04 plus postage.

Document Type: Non-Classroom Material (055); Computer Programs (101); Test, Questionnaire (160)

Major Descriptors: *Computer Software; *Disabilities; *Inservice Teacher Education; *Needs Assessment; *Questioning Techniques; *Questionnaires; *State Surveys

A manual and software package explain the development and use of the Special Education Survey, an instrument intended to aid states in developing inservice training and professional preparation programs. The instrument is based on the comprehensive system of personnel development as described by Public Law 94-142, the Education for All Handicapped Children Act. Administration of the In-Service Training and Staff Development Needs Survey is explained including selection of survey samples and using the table of random numbers. Further discussion covers advantages and disadvantages of survey research, principal methods of survey data collection, uses of survey data, interviewing methods, the art of asking questions, and questionnaire format. A checklist for writing survey questionnaires is provided. Also considered are accurate measurement, reliability, validity, and sampling. Another section gives guidelines for modifying the questionnaire to meet a state's unique needs. The final section of the manual provides a guide to the SpecEd Data Analysis Software, a data entry and storage system, intended to complement the Personnel Data Collection Instrument. The software allows entering/editing data from questionnaires, analyzing/printing selected data from the data file, exporting data to another software package, copying/deleting the data file, and modifying screen prompts and printout wording. The questionnaire itself is attached.

ED324833

Computer Assisted Instruction in Higher Order Skills for Mildly Handicapped Students: Programmatic Research on Design Principles. Final Report.

Carnine, Douglas W.

Oregon University, Eugene. College of Education.

1 Oct 1987, 142p. Numerous poorly photocopied pages.

Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, EDRS Price: MF01/PC06 plus postage.

Document Type: Research Report (143); Evaluative Report (142)

Major Descriptors: *Computer Assisted Instruction; *Instructional Design; *Instructional Effectiveness; *Mild Disabilities

This report summarizes a series of eight research studies related to the use of computer-assisted instruction (CAI) with mildly handicapped students at the junior high or high school level. Through videodisc and CAI the studies isolated the effects of the following design variables: (1) review cycles; (2) size of teaching sets; (3) explicit strategies; and (4) correction procedures. Studies involved three different kinds of CAI—drill and practice, tutorials, and simulations. Results indicated that properly designed CAI can be effective as an instructional medium if attention is paid to the academic task, the stage of instruction, and the role of the teacher. Detailed reports are presented in the form of preprints or reprints of journal articles with the following titles: "Applying Instructional Design Principles to CAI for Mildly Handicapped Students: Four Recently Conducted Studies" (John Woodward et al.); "Effects of Instructional Design Variables on Vocabulary Acquisition of LD Students: A Study of Computer-Assisted Instruction" (Gary Johnson et al.); "Elaborated Corrective Feedback and the Acquisition of Reasoning Skills: A Study of Computer-Assisted Instruction" (Maria Collins et al.); "Teaching Problem Solving through Computer Simulations" (John Woodward et al.); "The Effectiveness of Videodisc Instruction in Teaching Fractions

to Learning-Disabled and Remedial High School Students" (Bernadette Kelly et al.); and "Closing the Performance Gap in Secondary Education" (John Woodward et al.). References accompany each paper.

ED324847
Computer Access. Tech Use Guide: Using Computer Technology.
Council for Exceptional Children, Reston, VA. Center for Special Education Technology.
Jun 1989, 5p. For related documents, see ED 324 842-850.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Directory (132)
Major Descriptors: *Accessibility (for Disabled); *Computer Uses in Education; *Disabilities; *Input Output Devices; *Media Adaptation

One of nine brief guides for special educators on using computer technology, this guide focuses on access including adaptations in input devices, output devices, and computer interfaces. Low technology devices include "no-technology" devices (usually modifications to existing devices), simple switches, and multiple switches. High technology input devices include advanced switches, video pointing devices, modified keyboards, alternative keyboards, voice recognition devices, and optical character readers. Among output devices are non-computer-dependent or computer-dependent devices (including print enlargers, braillers, and light/sound transmitters) and speech synthesizers. Interfaces used to connect various devices with the computer are briefly discussed. Listed are six readings, four low technology devices, four advanced switches, two video pointing devices, two modified keyboards, four alternative keyboards, two voice recognition devices, one optical character reader, five non-computer-dependent output devices, four computer-dependent output devices, four speech synthesizers, three computer interfaces, and a video.

ED324848
Guide for Teachers. Tech Use Guide: Using Computer Technology.
Council for Exceptional Children, Reston, VA. Center for Special Education Technology.
Jun 1989, 5p. For related documents, see ED 324 842-850.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Directory (132)
Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; *Computer Uses in Education; *Disabilities; *Instructional Material Evaluation

One of nine brief guides for special educators on using computer technology, this guide is specifically directed to special education teachers and encourages them to become critical consumers of technology to ensure its most effective use. Brief descriptions of the various uses of the computer in the school setting—as an instructional tool, as an administrative/management tool, and as a telecommunication device—are provided. Several suggestions for selecting software include previewing for such features as those that allow students to monitor and evaluate their own progress. Variations in computer input and output devices to make the machines accessible to students with various disabilities are briefly considered. Teachers are encouraged to become familiar with the hardware and its uses, enroll in an introductory computer course, learn to use a program with immediate use such as word processing, and determine how to integrate the computer with the curriculum. Suggestions for introducing students to the computer include involving parents, letting students with computer experience help other students, and establishing rules about using the equipment. The need for keyboarding skills is stressed. Lists of 10 readings, 4 organizational resources, 8 periodicals, and 5 guides to software resources are provided.

ED324849
Hearing Impairments. Tech Use Guide: Using Computer Technology.
Council for Exceptional Children, Reston, VA. Center for Special Education Technology.
Jun 1989, 4p. For related documents, see ED 324 842-850.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Directory (132)
Major Descriptors: *Computer Uses in Education; *Electronic Equipment; *Hearing Impairments; *Telecommunications

One of nine brief guides for special educators on using computer technology, this guide focuses on advances in electronic aids, computers, telecommunications, and videodiscs to assist students with hearing impairments. Electronic aids include hearing aids, telephone devices for the deaf, teletypes, closed captioning systems for television, and remote signal devices. The fact that most instructional software can be used by this population with only minor modifications is noted and mention is made of various types of special instructional software to teach lip reading, signing, finger spelling, and vocalization. Word processing is recommended to improve written communication skills. The use of telecommunications is suggested to learn with and about students in distant places as well as to practice communication skills. Finally, combining videodisc technology and computer access can provide interactive instruction tailored to meet the learning needs of a student with hearing impairments. Lists of five readings, seven organizational or network resources, four periodicals, six software resources, and six hardware vendors conclude the guide.

ED324844
Learning Disabilities. Tech Use Guide: Using Computer Technology.
Council for Exceptional Children, Reston, VA. Center for Special Education Technology.
Jun 1989, 4p. For related documents, see ED 324 842-850.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Directory (132)
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Computer Uses in Education; *Learning Disabilities

One of nine brief guides for special educators on using computer technology, this guide focuses on computer use with learning disabled students for such purposes as direct instruction and development of communication skills. It is noted that the learning disabled student may possess certain characteristics which require the kind of modification of instruction that computers can provide. Possible hardware modifications are briefly considered. Criteria for selecting appropriate software for learning disabled students in general are provided as are specific criteria for software selected students with dyslexia or attention deficit disorder. Tool software, such as word processing programs are also recommended for these students. Resources listed include five readings, four organizations, seven periodicals, four language development software packages, four math software packages, four reading software packages, four spelling and writing software packages, four visual and perceptual software packages, and three speech synthesizers.

ED324845
Preschool Children. Tech Use Guide: Using Computer Technology.
Council for Exceptional Children, Reston, VA. Center for Special Education Technology.
Jun 1989, 5p. For related documents, see ED 324 842-850.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Directory (132)
Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *Disabilities; *Input Output Devices; *Media Adaptation

One of nine brief guides for special educators on using computer technology, this guide focuses on uses with preschool children with either mild to severe disabilities. Especially noted is the ability of the computer to provide access to environmental experiences otherwise inaccessible to the young handicapped child. Appropriate technology for this age group, such as alternative input devices and alternative output devices, is explained, and the role of the computer in helping provide a more natural play environment is described. Suggestions are offered for using the computer to help the child develop communication, language, and cognitive skills. Ways to use the computer for assessment and to increase preschooler access to programs are pointed out. Features of good software for preschools include: clear, concise documentation; sound educational value; uncluttered, interesting use of color, graphics, and sound; adaptability; limited key input or alternative device usage; and data collection capability. A glossary of 14 terms is provided, as are lists of seven recommended readings, five periodicals, five software resources, six alternative input software resources, three speech synthesizers, three input devices, and five switch manufacturers.

ED324843
Selecting Software. Tech Use Guide: Using Computer Technology.
Council for Exceptional Children, Reston, VA. Center for Special Education Technology.
Jun 1989, 4p. For related documents, see ED 324 842-850.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Directory (132)
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Computer Uses in Education; *Disabilities; *Instructional Material Evaluation

One of nine brief guides for special educators on using computer technology, this guide focuses on the selection of software for use in the special education classroom. Four types of software used for computer assisted instruction are briefly described: tutorials; drill and practice; educational games; and simulations. The increasing use of tool software systems (word processing, spreadsheet, and database systems) in educational settings is noted. An educational value is also seen in arcade and adventure games, which may be modified if necessary to increase their accessibility to students with disabilities. Specific criteria for evaluating software are offered in the areas of content, demands on the learner, instructional presentation, technical features, and documentation and management features. Four periodicals which regularly review software, six resources for public domain software, and six directories of software are listed.

ED324842
Telecommunication Networks. Tech Use Guide: Using Computer Technology.
Council for Exceptional Children, Reston, VA. Center for Special Education Technology.
Jun 1989, 5p. For related documents, see ED 324 843-850.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Non-Classroom Material (055); Directory (132)
Major Descriptors: *Computer Uses in Education; *Disabilities; *Networks; *Telecommunications

One of nine brief guides for special educators on using computer technology, this guide focuses on utilizing the telecommunications capabilities of computers. Network capabilities including electronic mail, bulletin boards, and access to distant databases are briefly explained. Networks useful to the educator, general commercial systems, and local bulletin boards are discussed in terms of their capabilities and costs, and specialized systems, such as SpecialNet, are also described. Specific ways in which telecommunications can be of use to the disabled individual are noted; among these are decreased isolation, business transaction services, and computer compensation for physical or sensory disabilities. Specific applications for special education students include communication and joint curriculum projects with distant classes, increased opportunities for written communication, and cross-age tutoring. Name, address, and descriptive information is provided for six networks for educators, six networks for children, and seven projects which integrate computer telecommunications with school programs. Eight readings are recommended.

ED324401
Technology for Persons with Disabilities. An Introduction.
IBM, Atlanta, GA. National Support Center for Persons with Disabilities.
4 May 1990, 51p.
EDRS Price: MF01/PC03 plus postage.
Document Type: Directory (132)
Major Descriptors: *Appropriate Technology; *Computers; *Disabilities; *Resources; *Social Support Groups; *Technological Advancement

This paper contains an overview of technology, national support organizations, and IBM support available to persons with disabilities related to impairments affecting hearing, learning, mobility, speech or language, and vision. The information was obtained from the IBM National Support Center for Persons with Disabilities, which was created to help health care leaders, agency directors, policy makers, employers, educators, public officials, and individuals learn how technology can improve the quality of life for disabled persons in the school, the home, and the workplace. The paper is organized in three sections. The first section discusses disabilities by the areas of hearing, learning, mobility, speech or language, and vision. The second section profiles IBM support programs for persons with disabilities. Information is included on offerings and programs for persons with disabilities, research and development, a program to train disabled persons, corporate support programs, and the Information System for

Advanced Academic Computing. The third section lists national support groups, describes their efforts, and provides addresses and telephone numbers for them.

ED331210

The Quantum Leap in Special Education: New Information and Communication Technologies. Their Impact upon Educational Opportunities for Disabled People, Focussing on How Integration in the Ordinary Educational System Can Be Facilitated. Draft Document.

Kristiansen, Rolf

United Nations Educational, Scientific, and Cultural Organization, Paris (France).

1988, 45p.

Available from: United Nations Educational, Scientific, and Cultural Organization, Paris 75700, France (free).

EDRS Price: MF01/PC02 plus postage.

Document Type: Non-Classroom Material (055); Project Description (141) Major Descriptors: *Computer Uses in Education; *Disabilities; *Information Technology

This paper suggests means of merging educational ideas with new information and communication technologies to aid individuals with disabilities. New technologies discussed include microtechnology and integrated circuits, high speed processing and retrieval of information, and light-weight equipment, among others. New technologies can be used as aids in mobility, communication, diagnosis, training, information processing, expressive and creative activities, and recreational activities. The role of new technologies (television, the modern car, etc.) as potential "disablers" for individuals with certain disabilities is also described, and ergonomical considerations such as display resolution and keyboard complications are examined. Technologies and equipment are then surveyed, such as radio and television, film and videotapes, electronic mail, voice recognition, touch screens, artificial intelligence, word processing, image processing, interactive video, digitalized and synthetic speech, and tactile displays. Impacts of new technologies on interpersonal communication, language acquisition, creativity, and other factors are noted. The question of equity and autonomy for all members of society is explored. Requirements for integrating disabled students within ordinary educational institutions are spelled out, focusing on the areas of: information collection and dissemination; adapted educational and social infrastructure; availability of suitable hardware and software; resource allocation and administration; physical and social integration; and ethical considerations. Implications of new technologies for teacher education are described.

ED333680

The Influence of Computer Experience on Attitudes and Learning for Preservice Deaf Teachers.

Mertens, Donna M.; Rabiu, Jubril

Apr 1991, 12p. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, April 3-7, 1991).

EDRS Price: MF01/PC01 plus postage.

Document Type: Conference Paper (150); Project Description (141)

Major Descriptors: *Computer Assisted Instruction; *Deafness; *Educational Quality; *Preservice Teacher Education; *Student Attitudes

This study investigated the effects of quality of educational experience with computers on attitudes toward computers and learning in a preservice educational psychology class for deaf students training to be teachers. Nineteen subjects used computer-assisted instruction modules for seven half-hour lessons on various educational psychology concepts. The majority of the students had positive reactions to the quality of the lessons, the computer feedback, the time allowed to complete the lesson, and the teacher's instruction. Using the Computer Attitude Scale, it was determined that students' attitudes toward computers changed in terms of reduced anxiety and greater confidence in using computers. Students' knowledge of educational psychology concepts increased after completion of each lesson. The results provide support that, if the nature of the students' computer experience is positive, then attitudes can be positively impacted. (23 references)

ED327037

A Model Teaching Environment for Using Word Processors with LD Children. The Writing Project. Technical Report No. 2.

Neuman, Susan B.; And Others

Education Development Center, Inc., Newton, Mass.

Oct 1985, 28p. For Technical Report No. 1, see ED 327 036; for other related documents, see ED 296 492 and ED 319 181.

Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.

Available from: The Writing Project, Educational Development Center, 55 Chapel St., Newton, MA 02160.

EDRS Price: MF01/PC02 plus postage.

Document Type: Evaluative Report (142)

Major Descriptors: *Learning Disabilities; *Teacher Role; *Teaching Methods; *Word Processing; *Writing (Composition); *Writing Instruction

This report presents first year (1984-85) findings of The Writing Project, a 2-year school-based study of the use of word processing to improve learning disabled children's writing skills. Based in three Massachusetts school districts, the project focused in the first year on intensive observation of 14 fourth grade children as they wrote with word processors. Two contrasting teaching environments were identified: the compliance model, aimed at promoting students' mastery of specific writing conventions and writing structures/ideas presented by the teacher; and the facilitation model, aimed at helping students generate and expand ideas and structures of their own. Facilitative models which promote student involvement in composing were found to have three overall characteristics: (1) teachers give children strategies for generating and organizing their own ideas; (2) teachers focus children's attention at the drafting stage on developing ideas in writing, rather than revising and editing, or on mastering the word processor; and (3) teachers reinforce children as capable thinkers and writers.

ED324838

Investigation of Interactive Technologies for a Risky Behaviors Program for Mildly Mentally Handicapped Youth. Final Report—Phase I.

Robey, Elaine; And Others

Macro Systems, Inc., Silver Spring, Md.

15 Mar 1990, 142p.

Sponsoring Agency: National Institute on Disability and Rehabilitation Research (ED/OSERS), Washington, DC.

EDRS Price: MF01/PC06 plus postage.

Document Type: Evaluative Report (142); Review Literature (070); Bibliography (131)

Major Descriptors: *Computer Software Development; *Decision Making; *Drug Abuse; *Interactive Video; *Mild Mental Retardation; *Multimedia Instruction

The study reported in this document investigated the feasibility of using an interactive multimedia computer environment to build the information base and decision-making skills of mildly mentally handicapped youth with the aim of combatting drug abuse behaviors. This report covers phase 1 of a projected 3-phase study. Its four chapters provide a general overview, a description of phase 1 activities, a description of the design plan, and a conclusion. Phase 1 activities included a literature review, review of existing products, a design team meeting, hardware and software review, solicitation of industry support, and creation of a preliminary design document. The design plan focuses on target audience, design principles, topic areas to be covered, product components, and design components. Appendices making up the bulk of the document contain letters of support from potential publishers, a list of literature review citations, an existing product review, and a summary of a design team meeting. The literature review contains bibliographic information and abstracts for 28 published resources and bibliographic information only for 76 resources. The existing product review lists and briefly describes 35 computer-based instruction and interactive videodisc systems, 57 videotapes and related media products, and 46 printed materials. Twenty references are included.

ED324837

Studies of Special Education Administrative Involvement in Computer Implementation. Final Report—Phase I.

Robey, Elaine; And Others

Macro Systems, Inc., Silver Spring, Md.

22 Feb 1989, 100p.

Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.

EDRS Price: MF01/PC04 plus postage.

Document Type: Research Report (143); Test, Questionnaire (160)

Major Descriptors: *Administrator Role; *Computer Assisted Instruction; *Computer Uses in Education; *Disabilities; *Special Education; *Teacher Role

The study reported in this document examined how special education administrators and staff in 100 school districts were involved in the adoption of new educational technology. The sample was drawn from the known population list of operating school districts from the Common Core of Data of the National Center for Educational Statistics. Selection procedures were designed to ensure coverage for the widest distribution of the population elements in the sample. Two survey forms were developed, one for special education administrators and the other for computer coordinators and special education teachers. Respondents included 100 administrators, 93 special education teachers, and 89 computer coordinators. Findings showed that administrative involvement in the decision making processes related to computers is high. Involvement in committee processes was reported by over half of the administrators; about two-thirds reported working with other administrators at the district level and half work with other administrators at the building level. One-third of teachers reported regular interaction between administrators and teachers. Teachers in special education programs are sharing computer resources with regular education through informal mechanisms. Technical assistance for computers is reported to be available by about 90% of administrators and teachers. Two-thirds of the administrators reported both purchase of computer technology for administrative purposes and regular use for professional purposes. Forty percent of teachers reported purchase of hardware or software for administrative applications. The report concludes with plans for Phase II of the study, a list of 19 references, and copies of the survey instruments.

ED326014

Research on the Use of Technology in the Education of the Learning Disabled: Project CREATE.

Weisgerber, Robert A.

American Institutes for Research in the Behavioral Sciences, Palo Alto, Calif.

31 Dec 1987, 93p. For related documents, see ED 277 166-171.

Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.

Report No: AIR-31400-12/87-FR

EDRS Price: MF01/PC04 plus postage.

Document Type: Project Description (141)

Major Descriptors: *Cognitive Processes; *Computer Assisted Instruction; *Learning Disabilities; *Man Machine Systems; *Perceptual Development; *Reading Instruction

Project CREATE was a 4-year federally funded research program which sought to determine ways in which computer technology could improve the education of learning-disabled students. Early work on the project centered on the development of a theoretical and conceptual foundation; a hierarchical conceptual model was constructed that related school performance in reading to underlying cognitive processing skills, perceptual enabling skills, and neuromuscular vision skills. Two California school districts were involved in the project: the Fremont Union High School District and the Cupertino Union School District. A software selection and evaluation tool (included in Appendix B) was developed, several adaptive software handbooks were produced, and two software programs were created (TurboScan and Wordsworth). Elementary students who received the TurboScan software treatment improved in their ability to rapidly discriminate critical features associated with character and word recognition, and demonstrated better reading skills. Secondary students who received the Wordsworth software treatment for cognitive processing development improved in their ability to recognize literal facts and details in narrative text and, to some extent, to make inferences. Student-machine interface conditions that acted as barriers to effective study were identified, and a facilitating interface was designed. An appendix contains scope and sequence information.

ED322883

Innovative Technology for Secondary Learning Disabled Students: A Multi-Faceted Study of Implementation.

Woodward, John; Gersten, Russell

[1988], 28p.

EDRS Price: MF01/PC02 plus postage.

Document Type: Research Report (143); Test, Questionnaire (160)

Major Descriptors: *Instructional Effectiveness; *Interactive Video; *Learning Disabilities; *Multimedia Instruction; *Remedial Mathematics

Computer use in the classroom is minimal for both special education students and other students. Reasons for non-use are that access to computers is limited, the quality of the instructional software is poor, and teachers find it difficult to integrate computer use with more traditional teaching methods. Interactive videodisc technology, while similar in many respects to computers, has the advantage of enhanced graphic capabilities in the form of slides, archival film, videotape segments, and computer graphics, as well as a narrative mode of presentation comparable to that of television. In a controlled experimental study of the Mastering Fractions videodisc program, significant positive effects on student achievement were demonstrated when the system was used to teach basic fractions concepts to remedial and special education secondary students. Seven teachers at 7 school sites in a large urban district taught 57 students for 6 weeks using the Mastering Fractions videodisc program. Results of the study showed: an increase in both teacher and student enthusiasm, greater interaction between teachers and students, superior student performance on a criterion-referenced test, and successful retention of the material after the original instruction. It is concluded that interactive video, while not a hidden remedy to the flagging technological revolution in the schools, may be a partial solution to the problem of effective teaching of difficult subjects. Six appended tables present supporting data, including both teacher and student responses to interviewers. (24 references)

Disadvantaged

ED326178

Using Microcomputers To Implement Mastery Learning with High-Risk and Minority Adolescents.

Christie, Nancy; Sabers, Darrell L.

1989, 12p. Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, March 30-April 2, 1989).

EDRS Price: MF01/PC01 plus postage.

Document Type: Research Report (143); Conference Paper (150)

Major Descriptors: *Computer Assisted Instruction; *Cooperative Learning; *High Risk Students; *Mastery Learning; *Minority Groups; *Social Influences

The setting for this study was a basic education component of a summer youth program designed to increase chances of high risk adolescents, mostly minorities, whose ages ranged from 14-18, to experience more positive academic and employment outcomes. The instructional program used in both experimental and control classrooms emphasized mastery learning of a selected set of mathematics and reading/language arts objectives. Pretests and posttests based on the objectives were developed using the Academic Instructional Measurement System. Of the four sites used, only one was the experimental site where the mastery learning program was implemented using the microcomputer. Quantitative assessment of the experimental program was provided by comparing the effect sizes of the experimental group with the effect sizes of the remaining three sites. Observations were made of the instruction given in the experimental classroom as well as one of the other program sites. The results provide additional evidence of the effectiveness of mastery learning techniques with high risk and minority students. Students at each location made sizeable gains in both mathematics and reading/language arts during a fairly short time period. Although the quantitative results did not show the computer setting to be more effective than the non-computer setting, the qualitative analyses of these two settings revealed educational benefits for high risk students in the computer environment that may not be reflected in a measure of academic achievement. These students demonstrated an increased sense of social integration and bonding, factors that may help to reduce dropout. (16 references)

ED330645
CCP: A Diagnostic/Prescriptive Approach to Remediation for "At Risk" Students.
Francis, Mary Louise
[16 Nov 1990], 8p.
EDRS Price: MF01/PC01 plus postage.
Document Type: Project Description (141)
Major Descriptors: *Computer Assisted Instruction; *Computer Managed Instruction; *Diagnostic Teaching; *High Risk Students; *Individualized Instruction; *Mastery Learning

The Comprehensive Competencies Program (CCP) is an alternative educational approach specializing in diagnosing deficiencies and prescribing appropriate learning materials (print, computer, audio-visual) at the correct level to help students progress toward "mastery" of their learning objectives. Academic subject areas include math, English as a Second Language (ESL), reading, writing, social studies, and science. "Functional" subject areas include occupational knowledge, consumer economics, government and law, citizenship competencies, health resources, and community resources. This competency-based program is individualized and self-paced. The computer management system allows for immediate feedback with unit tests after each sequence of lessons, and level tests after each sequence of units. Students receive individualized attention in a supportive environment. At-risk learners need a learning environment that is efficient, nonthreatening, and supportive, with real-life relevance and clearly stated learning goals. The CCP diagnostic/prescriptive approach can successfully be used with this at-risk population as a remedial "add on," a replacement for one or more subject area classes, or a completely alternative program of instruction in basic skills.

ED331209
The Use of Technology with Special Needs Students.
George Peabody College for Teachers, Nashville Tenn. John F. Kennedy Center for Research on Education and Human Development.
Research Progress, v8 n1 Nov 1990
Nov 1990, 6p.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: Review Literature (070); Serial (022)
Major Descriptors: *Computer Assisted Instruction; *High Risk Students; *Learning Strategies; *Problem Solving; *Special Needs Students

Progress is reported on research conducted in school settings to investigate methods to help students—especially at-risk students—to acquire and use knowledge to solve problems. The methods incorporate principles of learning and instruction derived from basic research on cognition. Specifically, the research involves using microcomputer and videodisc technology in three ways: to develop fluent access to knowledge and skills; to integrate knowledge to support subsequent problem solving; and to help students to be producers, not mere consumers, of knowledge. The enhanced motivation that seems to result from use of these technological innovations is also discussed. (10 references)

ED327175
Technology and Students at Risk of School Failure.
Hornbeck, David W.
North Central Regional Educational Lab., Elmhurst, IL.
1990, 22p. Paper commissioned for the Chief State School Officers' State Technology Conference (Minneapolis, MN, April 29-May 2, 1990).
EDRS Price: MF01/PC01 plus postage.
Document Type: Research Report (143); Conference Paper (150)
Major Descriptors: *Computer Assisted Instruction; *Educationally Disadvantaged; *Educational Technology; *High Risk Students

There are a multitude of academic and non-academic, economic, physical, and demographic conditions that place children in the high risk of failure category in elementary and secondary schools. Assistance for these children may come through computer-assisted instruction (CAI), not only because software is available that addresses student needs, but also because of the ability of the computer to empower students to take control of their own learning. Such experiences of control are integral to the academic success of at-risk students, many of whom feel a lack of control due to environmental, physical, mental, or language disabilities. While research has shown that CAI can help at-risk students learn basic skills such

as reading, writing, and mathematics, studies have also revealed that CAI helps students think critically, solve problems, and draw inferences. Technologies such as instructional video, videodisks, and distance education systems can be used to enhance motivation, interaction, and learning in at-risk students, while student databases can be used to produce, manage, and assist in the analysis of student performance, in planning instructional programs, and in organizing and tracking learning objectives for individual students.

ED333063
More Responsive High Schools, Student Information, and Problem Solving. Report No. 12.
Riehl, Carolyn; And Others
Center for Research on Effective Schooling for Disadvantaged Students, Baltimore, MD.
Mar 1991, 29p.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
EDRS Price: MF01/PC02 plus postage.
Document Type: Review Literature (070)
Major Descriptors: *Disadvantaged; *High Schools; *Information Needs; *Information Systems; *Information Utilization; *User Needs (Information)

High schools serving disadvantaged students typically lack the requisite information on students and their performance to identify and meet their needs. Most studies on the use of information by district-level administrators, principals, teachers, and other school staff are descriptive and focus on the thought processes of individuals or groups as they perform routine educational tasks, solve problems, and make decisions. Almost no studies have examined the relationship between information use and student outcomes. Educators appear to cope with imperfect data and time constraints by developing short-cuts to obtaining and interpreting information, or by making decisions based on outdated information. Innovative approaches to improving the gathering and use of information have emphasized the use of student assessment information to modify instructional techniques, the systematic examination of program characteristics and outcomes to solve problems, and the implementation of integrated computerized databases to organize information and make it accessible for analysis. The following guidelines for developing effective school information systems are offered: (1) the system must be closely linked to the various alternative courses of action that educators might pursue in their work; (2) the system must be based on the work roles of the school personnel who will use it; and (3) the resistance to accompanying changes in work roles must be overcome by integrating the new system into a broader goal, such as school restructuring. A list of 79 references is appended.

Early Childhood

ED324841
Investigation of Interactive Technologies for Early Math and Science Concepts for Preschool Children. Report—Phase I.
Colker, Laura J.; And Others
Macro Systems, Inc., Silver Spring, MD.
13 Apr 1990, 180p.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
EDRS Price: MF01/PC08 plus postage.
Document Type: Evaluative Report (142); Test, Questionnaire (160); Review Literature (070)
Major Descriptors: *Classification; *Disabilities; *Instructional Design; *Interactive Video; *Mathematics Instruction; *Number Concepts

This report describes phase 1 of a projected 2-phase project designed to investigate the feasibility of developing an interactive videodisc to teach math and science concepts to preschool handicapped children. A videodisc system is proposed that would allow children to manipulate real-world objects in order to acquire concrete knowledge about abstract concepts. The report covers Phase 1 activities, including target audience specification, literature review, interviews with experts in the relevant fields, product review, hardware and software review, the enlisting of industry support, and the design team meeting. A design plan is presented which specifies the target audience, educational principles, content, products, design components, and program operation. Appendices making up the greater part of the document include letters of support, copies of survey instruments, a summary of the design team meeting, the review of the literature, summaries of interviews with experts, and a product review. The literature review of 66 references covers the use of microcomputers in teaching preschool math and science, the use of

microcomputers in early childhood special education, the use of videodiscs with children, teaching science and math concepts in the preschool, and adapting preschool math and science for special education. The product review describes 121 math and science software programs available for preschoolers. Includes 13 references.

ED327295
Microcomputers and Young Children. Short Report.
ERIC Clearinghouse on Elementary and Early Childhood Education, Urbana, Ill.
1983, 3p. Based on sections of a report in ERIC: ED 227 967.
Sponsoring Agency: National Institute of Education (ED), Washington, DC.
EDRS Price: MF01/PC01 plus postage.
Document Type: ERIC Product (071)
Major Descriptors: *Computer Oriented Programs; *Computer Uses in Education; *Microcomputers; *Young Children

This ERIC Short Report on the use of microcomputers with young children provides a brief summary of related research and discussion of the ways computers can be used by educators and their students. Profiles of computer applications concern computer literacy, computer-assisted instruction, computer programming, computer art, word processing, and administrative uses.

ED330456
Is There a Legitimate Role for Computers in Early Childhood Programs?
Guddemi, Marcy; Fite, Kathy
Jan 1991, 7p. Paper presented at the Annual Meeting of the National Association for the Education of Young Children (Washington, DC, November 16-19, 1990).
EDRS Price: MF01/PC01 plus postage.
Document Type: Teaching Guide (052)
Major Descriptors: *Computer Uses in Education; *Early Childhood Education; *Elementary School Curriculum; *Microcomputers

Computers have a legitimate place in early childhood classrooms, provided that attention is given to appropriate software, location, and access. Software should be meaningful, be relevant to the early childhood curriculum, and meet children's needs. Word processing is one of the most appropriate ways to introduce computers into early childhood programs. Young children want to write, and the variety and number of language-related experiences they have will directly influence their command of oral and written language. The use of computers increases the number of children's experiential activities and the number of opportunities for risk-taking in emergent literacy activities. Computers placed in a freely available classroom writing center provide preschoolers with optimal access. The computer should be invitingly placed in a good, highly visible location. Research shows that computers strengthen specific skills, foster creativity and problem solving, and enhance the writing process. Children will view the computer as just another playground to explore and manipulate. They will not relinquish play in favor of sole dedication to computer exploration and will not fear the computer as some adults do.

ED326315
Curriculum Implications for Using Computers with Pre-Readers. What Are the Socializing Aspects?
Schmitt, Dorren Rafael
Nov 1990, 43p. Paper presented at the Annual Meeting of the Mid-South Educational Research Association (New Orleans, LA, November 1990).
EDRS Price: MF01/PC02 plus postage.
Document Type: Conference Paper (150)
Major Descriptors: *Computer Uses in Education; *Discourse Analysis; *Interpersonal Communication; *Prereading Experience; *Preschool Children; *Student Behavior

Three high-achieving and three low-achieving 4-year-olds attending prekindergarten at a private elementary school in New Orleans, Louisiana, were studied as they interacted with computers in dyads. Subject pairs were composed of one high- and one low-achiever and varied according to sex: boy/boy, boy/girl, and girl/girl. Qualitative methods of ethnographic observations and informal interviews were used to investigate ways in which the children reacted to and used computers while they used the Shapes, Opposites, Numbers, and ABC programs of the Stickybear series to learn classroom lessons. Findings in the areas of domains, components, and themes are reported. Domains identified were kinds of verbalizations, ways of exploration, the process of coping with lack of attention, and information about the

computer. Different types of talk were organized taxonomically to determine directions taken in conversations. Component analysis identified attributes of the four domains. Data indicated that students used exploring and questioning behaviors and talked with each other, with adults, and to the computers. Concluding discussion addresses two research issues: prereaders' difficulties in using computers and implications of the use of computers with prereaders for curricula. (22 references)

Gifted

ED332438
Teaching with Technology.
Hoctor, Marge, Ed.
California Association for the Gifted.
Communicator, v21 n1 Jan 1991
Jan 1991, 37p.
Available from: California Association for the Gifted, 23684 Schoenborn St., Canoga Park, CA 91304.
EDRS Price: MF01/PC02 plus postage.
Document Type: Serial (022); Project Description (141); Non-Classroom Material (055)
Major Descriptors: *Computer Software; *Creativity; *Educational Technology; *Gifted; *Teaching Methods

This journal issue gathers together several articles on teaching with technology, with special focus on teaching of gifted students in California. "Computers and Creativity: Tools, Tasks, and Possibilities" (Bernard J. Dodge) discusses how teachers can establish an environment that will nurture creativity through use of computers. "Technology Resources in Education (TRIE): Opportunities for Collaboration" (Craig Blurton) explains how teachers of gifted and talented students can make use of the TRIE electronic information service developed by the California Technology Project. "Increasing Educational Options through Distance Learning" (Robert Threlkeld), focusing primarily on distance learning for rural areas, examines the use of satellites and telephone lines and cites exemplary land-based distance learning programs. "Technology, the Gifted, and the Language Arts" (Stephen Marcus) describes new technologies for teaching language arts to gifted students, while emphasizing that the tools' vitality depends on talented teachers who offer an informed exuberance. In "An Open Letter to Parents of Students," David Moursund notes the importance of student access to computers and the value of integrating computer use with reading, writing, arithmetic, and problem-solving instruction. "Vision: Technologically Enriched School of Tomorrow (TEST)" (Gary G. Bitter) presents five recommendations of the International Society for Technology in Education. "Alternatives to Integrated Instructional Systems" (Peter Kelman) criticizes integrated instructional systems as being an inappropriate use of computers with students at risk and wasteful of limited school computer resources. Other papers include: "Technology and Change: From the Renaissance World to Microworlds" (Gail Marshall); "Empowering the Teacher" (David Dockterman); "Confessions of a Maverick Moderate" (Anne Beversdorf); and "An Investigation of Giftedness in Economically Disadvantaged and Limited English Proficiency Students" (Mary M. Frasier).

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